A

TREATISE

CONCERNING

The Husbandry *and* Natural History *of* ENGLAND,

In Twenty Two CHAPTERS, *viz.*

1. On *Saint Foin.*
2. Of Ploughs and Carriages.
3. Of digging of Land, setting and howing of Corn.
4. Of Gardening.
5. Of Smut and Mildew.
6. Of planting Fruits.
7. Of the Defect of Fruits.
8. Of *Vines.*
9. Of *Hemp* and *Flax.*
10. Of Dunging and Manuring Land.
11. Of the Improvement of Meadows.
12. Of Waste-Land.
13. Of Woods.
14. Of Bees.
15. Of Silk-Worms.
16. Of the Husbandry of other Countries.
17. Of our Ignorance of the Metals, Minerals, *&c.* produced in *England.*
18. Of our Ignorance of the Virtues and Uses of the Vegetables of *England.*
19. Of Animals, Fishes, Insects, *&c.*
20. Of divers Things necessary for the Good of Cattle.
21. Of many Necessaries wanting in Agriculture.
22. Of God's Blessing on the Husband-Man's Labour.

Useful for all Persons, especially those who have any Concern in Rural Affairs.

By Sir RICHARD WESTON,
Late of *Sutton* in the County of *Surrey*, and left by him, as a Legacy, to his SONS; with an Introduction addressed to them, written by himself.

And a Preface *by Mr.* SAM. HARTLIB.

The Second EDITION, Corrected and Improved.

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ADVERTISEMENT.

THE Subjects treated of in the following Sheets are of such general Use to Mankind, that there needs no Apology for the Publication of them. But perhaps it may be pretended, we are much improv'd in those Affairs since the Time of our Author. To which we answer, some few Things are, but many others of the utmost Consequence to this Nation are not, the Generality of People being bigotted to the Methods used by their Fathers, or others, have notoriously neglected making (or I may almost say attempting) any Discoveries in Agriculture, *or the Natural History of their Country. Likewise our modern Authors,* BRADLEY, &c. *are chiefly built on Theory; whereas the following Sheets are either founded upon the Author's own Experience, or his Friends. Vide* INTRODUCTION.

The Publisher.

To the READER.

Courteous Reader,

THE Diſcourſe which I formerly publiſhed, concerning the *Brabant Huſbandry*, was ſomewhat imperfect, the Author thereof being then unknown to me; but ſince I have learned who he was, I have got a more perfect Copy, which I now offer to the Publick. Sir RICHARD WESTON (the Author of the *Brabant-Huſbandry*) left the following Diſcourſe as a Legacy to his Sons, whoſe Introduction to that Diſcourſe I have here prefix'd. I could wiſh, that GOD would put it in the Heart of thoſe Worthies that manage the Publick Truſt, that by their Influence and Authority, theſe and ſuch like Means of Induſtry, may not be left wholly to the uncertain, diſorderly, and lazy Undertakings of private Men; but to have an Eye over them, and their Proceedings, which ſo plainly appears to be a Publick Concern. Therefore let us all join to entreat

and petition them, that in order to the Publick and General Welfare of this Common-Wealth, theſe two Things at leaſt may be thought upon and reſolv'd.

Firſt. In reſpect of the known Untowardneſs of the major Part of the People, who being wonderfully wedded to old Cuſtoms, are not eaſily won to any new Courſe, tho' never ſo much to their own Profit, that two or more fit Perſons, of approved Skill and Integrity, may be made Publick Stewards, or Surveyors; one of the Huſbandry, the other of the Woods of this Common-Wealth, and impower'd to overſee and take care of the Preſervation of what is, and by all good Improvement to procure and provide for what is wanting in the preſent Age: And (except ſome ſuch Expedients are uſed) it is very likely they will be wanting to ſucceeding Ages.

Secondly. That according to the uſual Cuſtom of *Flanders*, a Law might be made of letting and hiring Leaſes upon Improvement; where the Manner is, That the Farmer covenants on his Part to improve the Land to ſuch or ſuch a greater Rent, by an orderly and excellent Management of Huſbandry, as well as Building. The Landlord, on the other Side, covenants on his Part, at the Expiration of the ſaid Leaſe, to give ſo many

Years

Years purchaſe of the Improvement (according to the Argeement) which is three or four Years, or ſometimes more, or to give out of it ſuch a Parcel or Moiety of Ground. As if Land formerly going for Six Shillings an Acre, be upon Improvement worth Ten Shillings, or Thirteen Shillings and Four Pence an Acre; the Landlord is to give Four or Five Shillings upon every Acre, more or leſs, according to the Agreement. If it pleaſe GOD to bleſs theſe Motions, and that the *National Huſbandry* of this Common-Wealth be improv'd; we may hope thro' GOD's Bleſſing to ſee better Days, and be able to bear neceſſary and publick Burdens with more Eaſe to our ſelves, and for the Benefit of our Poſterity.

Thy Faithful Servant,

SAM. HARTLIB.

INTRODUCTION.

Sir *RICHARD WESTON*, late of *Sutton* in the County of *Surry*, his LEGACY to his SONS, &c.

My SONS,

I Have left this short ensuing Treatise *to you as a* LEGACY; *if I shall not live my self to shew you, what therein is written, by Example, which I know instructs far more than Precept; yet Precepts from a* dying Father, *instructing of his* Children *what he hath seen and known, and received Information of from Witnesses free from all Exceptions, should make such an Impression on them, as at least to believe their* Father *writ what he thought was true; and therefore supposes those Things worthy to be put in practice by them which he himself would have done, if it had pleased God to have granted him Life and Liberty; especially seeing the Matter it self, which is required by him to be done, is in View so profitable, and so easy to be effected, and with so little Charge, considering the great Gain that is proposed by it, that not any thing can restrain a rational*

tional Man from the Trial thereof, but not giving Credit to the Relator.

The whole Discourse shews you how to improve barren, heathy Land, and how to raise more than ordinary Profit therefrom, by such Ways and Means as are not practised in England, *but as commonly in some Parts of* Brabant *and* Flanders, *as the Husbandry of* Wheat *and* Rye *is here. By that Means you may nobly augment your Estates, and will receive so much the more Profit and Praise, as by your Industry and Diligence you govern your Affairs; and will not only be imitated, but also honour'd by your Neighbours, when they shall see your Labours prosper so far as to convert barren and heathy Ground, left unhusbanded for many Ages, into as commodious arable Land, with Pastures and Meadows, as any in this Kingdom. And certainly, that Man is worthy of Praise and Honour, who being possessed of a large and barren Demeasne, constrains it by his Labour and Industry to produce extraordinary Fruits; which redounds not only to his own particular Profit, but also to the Publick Benefit.* Cato *says,* It is a great Shame to a Man, not to leave his Inheritance greater to his Successors than he received it from his Predecessors; and that he despises the Liberality of God, who by Slothfulness loses that which his Land may bring forth, not seeming willing to reap the Fruits which God has offer'd him.

Nay,

Nay, he threatens the Crime of High-Treaſon *to thoſe* that do not augment their Patrimony ſo much as the Increaſe ſurmounts the Principal. *It is a Thing much celebrated by Antiquity, and thought the nobleſt Way to gather Wealth, for to employ one's Wit and Money upon Land, and by that means to augment his Eſtate. If you obſerve the common Courſe of Things, you will find that Huſbandry is the End which Men of all Eſtates in the World point at. For to what Purpoſe do Soldiers, Scholars, Lawyers, Merchants, and Men of all Occupations and Trades, toil and labour with great Affection, but to get Money; and with that Money, when they have got it, to purchaſe Land? And to what End do they buy that Land, but to receive the Fruits thereof? And how ſhall one receive the Fruits of it, but by his own Huſbandry, or a Farmer's? So that it appears by degrees, that what Courſe ſoever a Man takes in the World, at laſt he comes to Huſbandry, which is the moſt common Occupation among Men, the moſt natural and holy, being commanded by the Mouth of* God *to our firſt Father. There is Care and Diligence requiſite in Huſbandry, as there is in all the Actions of the World; and therefore as a Captain hath a Lieutenant to command his Soldiers in his Abſence, or for his Eaſe, ſo muſt you provide ſome able honeſt Man, to whom you may commit the Execution*

of such Things as you can't do without too much Labour; whereof you must often take an Account, and confer with him, as Occasion shall require, about your Business, that nothing may be left undone for want of Prudence. To such a Man you must give good Wages, with Intent to advance your own Gain, and take the more Ease, by reason of his Honesty and Knowledge.

You will find this Husbandry, after you have once had Experience of it, to be very pleasing to you, and so exceeding profitable, that it will make you diligent: For no Man of any Art or Science (except an Alchymist) ever pretended so much Gain any other Way, as you shall see demonstrated in the ensuing Treatise. *The Usurer doubles but his Principal, with Interest upon Interest in seven Years; but by this little* Treatise *you shall learn how to do more than treble your Principal in one Year's Compass. And you shall see how an industrious Man in* Brabant *and* Flanders *would bring five Hundred Acres of barren and heathy Land, that was not worth at the most above five Pounds a Year, to be worth seven Hundred Pounds a Year in less than seven Years. I know no Reason why the like may not be done in* England; *for we are under as good a Climate as they are; our heathy Land, that is neither Sand nor Loam, is as good a Soil as their barren Ground is. We have not only Dung to enrich our Land, but also Lime and Marl, of which*

which they know not the Use, where they sow their most gainful Commodities mention'd in the ensuing Treatise, *nor of any other Manure, but only Dung. In fine, I am certain there is none of their Commodities but will grow in* England *as they do in* Brabant *and* Flanders; *but ours are not of the same Kind as theirs, nor put to the same Use. What can't be vented at Home may as well be vented from hence into* Holland, *as the like Commodities are from* Flanders *there. I will say no more of this Subject in the Preface; only it remains to tell you, that you must not expect either Eloquence or Method in the ensuing* Treatise, *but a true Story plainly set forth in the Last Will and Testament of your* Father; *which he would have you execute: But before all things, to be sure you lay the Foundation of your Husbandry upon the Blessing of Almighty* GOD; *continually imploring his divine Aid and Assistance in all your Labours; for it is* GOD *that* gives the Increase: *And believing this as the Quintessence and Soul of Husbandry,* Primum quærite Regnum Dei; & postea hæc omnia adjicientur vobis. *These Things being briefly premised, I will leave the rest to the Work, and commit you all, with a* Father's *Blessing, to the Protection and Providence of Almighty* GOD.

Your Loving Father,

RICH. WESTON.

A

TREATISE

Concerning the

Husbandry *and* Natural History *of* England, &c.

Written to Mr. Sam. Hartlib.

CHAP. I.

Of Saint Foin.

SIR,

ACcording to your desire, I have sent you what I have observed in *France* about the sowing of a seed commonly call'd *Saint Foin*, which in *England* is as much as to say *Holy-Hay*, by reason, as I suppose, of the excellency of it. It's call'd by *Parkinson*, in his *Herbal*, where you may see a perfect description of it, *Onobrychis Vulgaris*, or *Cocks-Head*; because of

its flower, or *Medick Fetchling:* By ſome it is called *Polygala*; becauſe it cauſeth cattle to give abundance of milk. The Plant moſt like it, and commonly known (being frequently ſown in gardens) is that which is called *French Honey-ſuckle*, and is a kind of it, though not the ſame. *France*, although it be ſuppoſed to want the feweſt things of any country in *Europe*, yet it hath no ſmall want of *Hay*, eſpecially about *Paris*; which hath neceſſitated them to ſow their dry and barren lands with this ſeed. Their manner of ſowing it is done commonly thus: When they intend to let their Corn-lands lie, becauſe they are out of heart, and not ſituate in a place convenient for manuring, then they ſow that land with *Oats* and theſe ſeeds together, about equal parts. The firſt year they only mow their *Oats*, leaving their *Saint Foin* to take root and ſtrength that year: Yet they may if they pleaſe, when the year is ſeaſonable, mow it the ſame year it is ſown; but it's not the beſt way to do ſo. The year following they mow it; and ſo do ſeven years together: the ordinary burthen is about a load, or a load and a half in good years, upon an *Arpent*, [which is one hundred ſquare Poles or Rods, every Pole or Rod being twenty Feet] which quantity of ground being nigh a fourth part leſs than an *Engliſh* Acre, within a league of *Paris* is uſually rented at ſix or ſeven ſhillings. After the land hath reſted ſeven years, then they uſually break it up, and ſow it with corn till it is out of heart, and then ſow it with *Saint Foin* as formerly: for it does not impoveriſh land, as *Annual Plants* do; but after ſeven years, the roots of this plant being great and ſweet, as the roots of *Liquorice*, do rot, being turned up by the Plough, and enrich

rich the land. I have ſeen it ſown in divers places here in *England*; eſpecially in *Cobham-Park* in *Kent*, about four miles from *Graveſend*; where it hath thriven extraordinary well upon dry chalky banks, where nothing elſe would grow: and indeed ſuch dry barren land is moſt proper for it, as moiſt rich land for the great *Trefoil*, or great *Clover-Graſs*, although it will grow indifferently well on all lands; and when the other graſſes and plants are deſtroy'd by the parching heat of the Sun, becauſe their roots are ſmall and ſhallow, this flouriſheth very much, having very great root and deep in the ground, and therefore not eaſily to be *exſiccated*; as we have obſerved *Ononis*, or *Reſt-Harrow*, commonly to do on dry lands; but if you ſow this on wet land, the water ſoon corrupts the root of it. This plant, without queſtion, would much improve many of our barren lands, ſo that they might be mowed once every year, at leaſt ſeven years together, and yield excellent fodder for cattle, if it be rightly managed; otherwiſe it comes to nothing, as I have ſeen by experience. I therefore counſel thoſe who ſow this, or the great *Trefoil*, or *Clover Graſs*, or any other ſort of graſſes, that they obſerve theſe Rules.

1. That they make their ground fine, and kill all ſorts of other graſſes and plants; otherwiſe, they being native *Engliſh*, will by no means give way to the *French* ones, eſpecially in this moiſt climate. And therefore they are to be blamed, who with once ploughing ſow this or other ſeeds; for the graſs preſently grows up and chokes them, and ſo by their negligence, and ill huſbandry, diſcourage themſelves and others.

2. Let them not be too ſparing of their ſeeds; for the more they ſow, the cloſer and thicker they

will grow, and presently so fully stock the ground, that nothing, else can grow. And farther, the seeds which come from beyond sea, are oftentimes old and much decayed, and therefore the more seed is required.

3. Not to expect above seven years profit by it; for in that time it will decay, and the natural grass will prevail over it. For every plant hath its period, some in one year, some in two, others in three, as the common *Thistle*; and therefore after seven years let them either plough the land up, and sow it with that same seed again, or with other grain, as they do in *France*.

4. Let not sheep or other cattle bite them the first year, that they may be well rooted; for these grasses are far sweeter than the ordinary grasses; and cattle will eat them down, leaving the other, and consequently discourage their growth.

5. The best way, if men will be at the charge, is to make their ground very fine, as they do when they are to sow *Barley*, and harrow it even, and then to how seeds in alone, without any other grain, as the gardeners do *Pease*; yet not at so great a distance, but let them make the ranges about a foot's bread thone from another, and they shall see their grasses flourish, as if they were green-*Pease*, especially if they draw the how through them once or twice that summer, to destroy all the weeds and grasses. And if they do thus, the great *Clover* and other seeds may be mowed even twice the first year, as I have experimented in divers small plots of ground.

There is likewise at *Paris* another sort of fodder, which they call *La Lucern*, which is not inferior, but rather preferr'd before *Saint Foin*, for

for dry and barren gounds; which hath been lately brought thither, and is managed as the former: and truly every day produces ſome new thing, not only in other countries, but alſo in our own. And though I cannot but very much recommend theſe plants unto my countrymen, knowing that they may be beneficial to this nation, yet I eſpecially recommend unto them a famous kind of graſs growing in *Wiltſhire*, nineteen miles from *Saliſbury*, at *Maddington*, which may better be call'd one of the wonders of this land, than the *Hawthorn-tree* at *Glaſſenbury*, which ſuperſtition made ſo famous; for divers of the ſame kind are found elſewhere. You may find this graſs briefly deſcribed in a book called *Phytologia Britannica*, which lately came forth, and ſet down even all the plants which have been found naturally growing in *England*; *Gramen Caninum ſupinum longiſſimum*, which groweth nine miles from *Saliſbury*, Mr. *Tucker*'s at *Maddington*, wherewith they fat Hogs, and which is twenty-four feet long; a thing almoſt incredible, yet commonly known to all the ſhire. Now, without queſtion, if the ſeed of this graſs be ſown in other rich Meadows, it will yield extraordinarily; tho' perchance not ſo much as in its proper place. I wonder that thoſe that live thereabouts have not tried to fertilize their other Meadows with it; for it is a peculiar ſpecies of graſs; and tho' ſome ingenious men have found about ninety ſpecies of graſſes in this iſland, yet there is none like to this, that can by any means be brought to ſuch an height and ſweetneſs. And I ſuppoſe, that the thorough examination of this graſs is a thing of very great importance, for the improvement of Meadows and Paſtures; and it may excel the great *Treſoil*, *Saint Foin*, *La Lucern*,

Lucern, or any exotick plant whatſoever. And though I am very unwilling to exceed the bounds of an Epiſtle, yet I cannot but certify you wherein the Huſbandry of this nation in other particulars, as I ſuppoſe, is very defective, which I will do as briefly as may be; and likewiſe, how ingenious men may find Remedies for theſe Defects.

CHAP. II.

Concerning Ploughs and Carriages.

FIRST, he would do the honeſt and painful Huſband-man a very great pleaſure, and bring great profit to this nation, who would facilitate the going of the Plough, and lighten our ordinary Carriages. I wonder that ſo many excellent Mechanicks, who have beaten their brains about the Perpetual Motion and other curioſities, that they might find the beſt ways to eaſe all Motions, ſhould never ſo much as honour the *Plough* (which is the moſt neceſſary inſtrument in the world) by theirlabour and ſtudies. I ſuppoſe all know, that it would be an extraordinary benefit to this country, if one or two horſes could plough and draw as much as four or ſix; and alſo, that there is no ſmall difference in Ploughs and Waggons, when there is ſcarce any ſure rule for making them; and every country, yea almoſt every county, differs not only in the Ploughs, but even in every part. Some with wheels, others without; ſome turning the Reſt (as they call it) as in *Kent*, *Picardy*, and *Normandy*, others not: ſome having Coulters of one faſhion, others of another; others, as the *Dutch*, having an iron wheel or circle for

that

that purpoſe, ſome having their Shares broad at point; ſome not; ſome being round, as in *Kent*; others flat; ſome tying their horſes by the tails, as in *Ireland*. So likewiſe Waggons and Carts differ: ſome uſing four wheels, others two only; ſome carrying timber on two wheels in a Cart, others with four wheels and a long pole only between, which is the beſt way; ſome plough with two horſes only, as in *Norfolk*, and in *France* and *Italy* I never ſaw above three horſes in a Plough, and one perſon only to hold and drive: but in *Kent* I have ſeen four, ſix, yea twelve horſes and oxen. Which variety ſheweth that the Huſband-man, who is ordinarily ignorant in Mechanicks, is even at his wits end in this inſtrument, which he muſt neceſſarily uſe continually. Surely he would deſerve very well of this nation, and be much eſteem'd by all, that would ſet down exact Rules for the making of this moſt neceſſary inſtrument, and for every part thereof: for without queſtion there are as exact Rules to be laid down, as well for this as for Shipping and other things. And in Shipping, how have we, within theſe ſix years, gone beyond all nations? For which Art ſome deſerve eternal honour: and why may we not in this? I know a Gentleman, who is now beyond ſea, where he excels even the *Hollanders* in their own buſineſs of draining, who promiſeth much in this kind, and I think he is able to perform it: I could wiſh he were called on to make good his promiſe. In *China* it is ordinary to have Waggons to paſs up and down without horſes or oxen, with ſails, as ſhips do. And lately, in *Holland*, a Waggon was framed, which, with ordinary ſails, carried thirty people ſixty *Engliſh* miles in four hours. I know ſome excellent Scholars, who

who promiſe much by the means of *horizontal Sails*, *(viz.)* to have three or four Ploughs to go together; which ſhall likewiſe both ſow and harrow.

I dare not, being ignorant in theſe high ſpeculations, engage my ſelf to do much thereby; but wiſh theſe gentlemen, whom I know to be very ingenious, would attempt ſomething, both for the ſatisfying of themſelves and others. There is an ingenious *Yeoman* of *Kent* who hath two Ploughs faſtened together very finely, by which he ploughs two furrows at once, one under another, and ſo ſtirreth up the land twelve or fourteen inches deep; which in deep land is good. Near *Greenwich* there lives a Gentleman, who hath excellent corn on barren land, and yet ploughs his land with one horſe, when as uſually through *Kent* they uſe four or ſix. Theſe things ſhew that much may be done in this kind; and I hope ſome, in theſe active times, will undertake and accompliſh this work of ſo great importance.

CHAP. III.

Concerning digging of Land, Setting and Howing of Corn.

THERE is a Book long ſince printed, made by Sir *Hugh Plattes*, (the moſt curious man of his time) called, *Adam's Art revived*; wherein is ſhewed the great benefit which would accrue to this nation, if all land which were fit to be digg'd, were ſo ordered, and their corn ſet. Mr. *Gab. Plattes* likewiſe hath written much of this kind, and promiſeth that men ſhall reap one hundred for one; all charges borne,

borne, which are very great. That this may be true, he brings ſome probable reaſons, ſuppoſing that leſs than a peck of *Wheat* will ſet an Acre. I dare not promiſe ſo much as theſe Gentlemen do: neither can I commend Mr. *Gab. Plattes*'s Setting-Inſtrument, for I know there are many difficulties in it, which he himſelf could never get through; but concerning digging and ſetting, and howing in of corn, theſe things I dare maintain.

1. That it is a Defect in Huſbandry, that it is uſed no more.

2. That one good digging, becauſe it goes deeper than the Plough, and buries all weeds and kills the graſs, is as good as three Ploughings; and, if the Land be mellow, not much more chargeable.

3. That it would imploy many thouſand people: that a third part of the ſeed might be ſaved. As I have found by experience, that all the weeds and graſs might be more eaſily deſtroyed thereby, and the ground better accommodated for other crops; and to conclude, the crop conſiderably greater. Yet thus much I muſt farther ſay concerning ſetting of Grain, That great *Beans* are even of neceſſity to be ſet, and that ſmall *Beans* in *Surrey*, and other places, are likewiſe ſet with profit, for the reaſons above mentioned; but to ſet *Peaſe* (unleſs *Haſtevers*) *Oats*, or *Barly*, is ridiculous: but *Wheat*, although in divers grounds it may be ſet with profit, yet to *how it in* (as the Gardeners ſpeak) as they do *Peaſe*, though not at the ſame diſtance, but about a foot the ranges one from another, is better than ſetting, for theſe Reaſons.

1. Becauſe to ſet corn is an infinite trouble and charge; and if it be not very exactly done, which

children neither can nor will do, and theſe muſt be the chief ſetters, will be very prejudicious.

2. If worms, froſt, ill weather, or fowls, deſtroy any part of your ſeed, which they will do, your crop is much impaired.

3. The ground cannot be ſo well weeded, and the mould raiſed about the roots by the How: which three inconveniencies are remedied by the other way.

Farther, I dare affirm, that after the ground is digged or ploughed and harrowed; even it's better to *how Wheat* in, than to ſow it after the *common way*; becauſe that the weeds may be eaſily deſtroyed, by running the How through them in the ſpring, and the mould raiſed about the roots of the corn, as the Gardeners do with *Peaſe*, it would ſave much corn in dear years, and for other reaſons before mentioned. Yea, it is not more chargeable; for a Gardener will *how* an acre for five ſhillings, and in the ſpring, for leſs money, run it over with a How, and cut up all the weeds, and raiſe the mould: which charges are not great, and you will ſave above a buſhel of ſeed, which in dear years is more worth than all your charges.

Farther, one ſhilling and ſix pence an acre for the ſowing and harrowing of an acre in *Kent* is accounted a reaſonable price; but if any fear charges, let him uſe a Drill-plough. I therefore cannot but recommend the *howing in* of *Wheat*, as an excellent piece of good Huſbandry, whether the ground be digged or ploughed; not only becauſe it ſaves much corn, imploys many people, and is not chargeable; but alſo as it deſtroys all weeds, fitteth grounds for after-crops, and cauſeth a greater increaſe; and, in my apprehenſion, is a good Remedy againſt Smut and Mildew.

Mildew. There is an ingenious *Italian*, who wonders how it comes to pass, that if one sets a grain of corn, as *Wheat*, *Barly*, &c. it usually produces three or four hundred, as I have tried: yet if you sow *Wheat* after the ordinary way, six or eight for one is accounted a good crop; what becomes of all the corn that is sown, when as the fiftieth part, if it grew, would be sufficient? In answer to this;

1. I say, much corn is sown, which nature hath destinated for the Hens and Chickens, being without any considerable vegetative faculty.

2. Worms, Frosts, Floods, Crows and Larks, devour not a little.

3. Weeds, as *Poppy*, *May-weed*, and the grasses growing with the corn, destroy much.

Lastly, when corn is sown after the ordinary manner, much is buried in the furrows; especially if the ground be grazy: much is thrown on heaps in holes, and, consequently, starve and choak one another. Most of these inconveniencies are to be remedied by this way of setting and howing in of corn.

CHAP. IV.

Concerning Gardening.

GArdening, though it be a wonderful improver of lands, as it plainly appears by this, that they give extraordinary rates for land, *viz.* from forty shillings *per* acre to nine pound, and dig, how, and dung their lands, which is very expensive; yet I know some, by two or three acres of land, maintain themselves and family, and imploy others about their ground; and therefore their ground must yield a wonderful increase,

or elſe it could not pay charges; yet I ſuppoſe there are many Defects in this calling.

1. Becauſe it is but of few years ſtanding in *England*, and therefore not deeply rooted. About fifty years ago, about which time Ingenuities firſt began to flouriſh in *England*, this Art of Gardening began to creep into *England*, in *Sandwich*, and *Surrey*, *Fulham*, and other places.

Some old men in *Surrey*, where it flouriſhes very much at preſent, report, That they knew the firſt Gardeners that came into thoſe parts, to plant *Cabbages* and *Cauliflowers*, and to ſow *Turnips*, *Carrots*, and *Parſnips*; to ſow *Raith* (or early ripe) *Rape*, *Peaſe*; all which at that time were great rarities, we having few or none in *England*, but what came from *Holland* and *Flanders*. Theſe Gardeners, with much ado, procured a plot of good ground, and gave no leſs than eight pound *per* acre, yet the Gentleman was not content, fearing they would ſpoil his ground, becauſe they dug it. So ignorant were we of Gardening at that time.

2. Many parts of *England* are yet ignorant. Within twenty years a famous Town*, within leſs than twenty miles of *London*, had not ſo much as a meſs of *Peaſe* but what came from *London*; where, at preſent, Gardening flouriſheth much. I could inſtance divers other places, both in the North and Weſt of *England*, where the name of Gardening and Howing is ſcarcely known; in which places a few Gardeners might have ſaved the lives of many poor people, who have ſtarved theſe dear years.

3. We have not Gardening ware in that plenty and cheapneſs (unleſs perhaps about *London*) as

* *Graveſend.*

as in *Holland* and other places, where they not only feed themſelves with Gardeners ware, but alſo fat hogs and cows.

4. We have as yet divers things from beyond ſea, which the Gardeners may eaſily raiſe at home, though nothing nigh ſo much as formerly; for in Queen *Elizabeth*'s time, we had not only our Gardiners ware from *Holland*, but alſo *Cherries* from *Flanders*, *Apples* from *France*, *Saffron* and *Liquorice* from *Spain*, *Hops* from the *Low Countries:* and the *Frenchman* who writes the *Treaſure Politick*, ſaith, that it's one of the great Deficiencies of *England*, that *Hops* will not grow there: whereas now it is known, that *Liquorice*, *Saffron*, *Cherries*, *Apples*, *Pears*, *Hops*, and *Cabbages* of *England*, are the beſt in the world. Notwithſtanding we, as yet, want many things; as for example, we want *Onions*; many coming to *England* from *Flanders* and *Spain*; *Madder*, for dying, comes from *Zurick-ſea* by *Zealand*; we have red *Roſes* from *France*; *Anniſe-ſeeds*, *Fennel-ſeeds*, *Cummine*, *Caraway* and *Rice* from *Italy*; which, without queſtion, would grow very well in divers moiſt lands in *England*; yea, *Sweet Marjorum*, *Barley*, and *Gromwell-ſeed*, and *Virga Aurea*, they grow in our hedges in *England*.

Laſtly, Gardening is defective in this particular: that we have not Nurſeries ſufficient in this land of *Apples*, *Pears*, *Cherries*, *Vines*, *Cheſtnuts*, *Almonds*; but Gentlemen are neceſſitated to ſend to *London* many hundred miles for them.

Briefly, for the advancement of this ingenious calling, I only deſire, that induſtrious Gentmen would be pleaſed to encourage ſome expert workman into the places where they live, and to lett them land at a reaſonable rate, and if they be

be poor and honeſt, to lend a little ſtock; they will ſoon ſee the benefit that will redound, not only to themſelves, but alſo to their neighbours, eſpecially the poor, who are not a little ſuſtained by the Gardener's labours and ingenuities.

CHAP. V.

Of Smut and Mildew.

OUR Huſbandry is deficient in this, that we know not how to remedy the infirmities of our growing corn, eſpecially Smut and Mildew; to inſtance in theſe two only, which oftentimes bring great calamities to theſe nations: Smut in wet years, Mildews in dry. Theſe diſtempers in corn are not only in our country, but alſo in other places. A learned *Author ſaith, "That Smuttineſs of corn, which makes it ſmell "like a red-herring, was not known in *France* "till about 1530, at which time the great foul "diſeaſe began to break forth; which he con-"ceiveth from hence to have ſome original, as "alſo the camp-diſeaſe." Mildews are very great in the kingdom of *Naples*, which often ſtick to the ſcithes of thoſe that mow graſs and corn: and (God be thanked) we are not troubled with Locuſts, which is a great flying Graſshopper; nor Palmer-worms, which is a kind of great black Caterpiller, nor with great Hail in ſummer, nor with great Draught, which ſtifleth the ear in the ſtalk; which calamities, in hot countries, do very often totally deſtroy the honeſt and patient Huſband-man's labours: neither are we troubled with extreme Colds, which,

* *Helmont.*

which, in *New-England* and other cold countries, do often deſtroy the corn. But to return to our purpoſe.

And firſt briefly to ſhew you my opinion concerning the cauſe of Smuttineſs. I deſire not to fetch cauſes afar of, and to tell you of the ſad Conjunctions of *Mars* and *Saturn* (for I think *Quæ ſupra nos*, belong not to us) whenas we have enough at home: this is certain, that there are many evident cauſes of this corruption of corn.

1. A moiſt ſeaſon about Kerning-time: which moiſture either corrupteth the roots of the plant, or the nouriſhment of it, or the ſeed in its embryo; or, perhaps, in ſome meaſure all theſe.

2. Low, moiſt, foggy ground, for the reaſons above mentioned.

3. Dung'd land. In vineyards it's obſerv'd, that dung cauſeth more increaſe in quantity, but leſs in goodneſs; ſo that the ill taſte of the dung may eaſily be diſcerned, becauſe wine hath an high taſte; without queſtion the ſame happeneth to other Plants, although it be not ſo eaſily diſcerned; for the ferment, or ill odour of the dung, cannot be over maſter'd by the Plants: as we ſee alſo in animals, that corrupt diet cauſeth unſavory taſtes in the fleſh; ſo Hogs in *Newfoundland*, where they are nouriſhed by fiſh, may by their taſtes be called rather Sea-porpuſſes than Land-ſwine.

4. The ſowing of Smutty corn often produceth Smuttineſs: the ſon like unto the father. I account Smutty corn an imperfect or ſick grain, and ſuppoſe that by a microſcope the imperfection may be diſcerned.

Laſtly, the ſowing of the ſame ſeed often on the ſame field cauſeth Smuttineſs; becauſe that nitrous

trous juice, which is convenient for the nouriſhment of the grain, hath been exhauſted in the precedent years; and therefore it is excellent huſbandry every year to change the ſpecies of grain, and alſo to buy your ſeed-corn from places far diſtant. I am informed of a Gentleman, who ſow'd ſome *Wheat* which came from *Spain*, where the grain is uſually very hard and flinty, and as it were tranſparent, and far weightier than ours (as it appeareth by a meaſure at *Amſterdam*, which holdeth about three buſhels, and if our *Wheat* in the northern parts weigheth 160, the ſouthern corn weigheth ſometimes 180, 200, 220) and had a crop beyond expectation.

The uſual Cures of Smuttineſs, beſides thoſe mention'd before, are theſe.

1. To lime your ground, which warmeth and dryeth the land.

2. To lime your corn: which is done thus; firſt, ſlack your lime, and then moiſten your corn, or lime, and ſtir them together, till your grain be as big as a ſmall *Peaſe*. This liming preſerveth corn likewiſe from birds and worms, and is found a very good remedy againſt this diſeaſe: others make a ſtrong lye with common ſalt, and ſteep their corn in it all night, and then draw away their lye for farther uſe; which ſeldom fails of its deſired effect. Whether this doth by its corroſiveneſs mortify the weak and imperfect corn, ſo that it will not grow; or whether it be a remedy to cure the imperfections thereof, is worth the enquiry. I ſuppoſe this lye doth exſiccate the ſuperfluous humidity, which is the cauſe of this corruption. If corn be brought into the barn very Smutty, in *Kent* they uſually thraſh it on dry floors plank'd with boards: by which means the Smuttineſs is beat away,

and

and ſticks not to the grain, only a little blackneſs appears about the eye.

Mildew is, without queſtion, an unctuous dew, which deſcends from above about *Midſummer*: it abounds in dry years, as Smuttineſs in moiſt. I cannot think that there is ordinarily any malignity in this dew; but it produces its effects by manifeſt cauſes, *viz.* from an oily viſcous quality, which ſtops the pores of the husk wherein the *Wheat* lieth, and deprives it of air, and conſequently of nouriſhment: for air is the life of all things. I have heard, and do believe, that if you ſtreak an ear of *Wheat* with oil, it will produce the ſame effect. I am ſorry I never tried, that I might better have underſtood the nature of this ſad calamity, which often ruins the induſtrious Huſband-man, and cauſes great ſcarcity in this iſle. It is to be obſerved farther, that *Wheat* only ſuffers conſiderable damage by Mildew; becauſe it lies in a chaffy husk, which other grains do not. The grounds moſt ſubject to Mildew are theſe:

1. Thoſe that are incloſed with trees and high hedges. And truly this is the only great inconveniency I find by encloſures.

2. Low vallies. I have ſeen very often in the ſame field, the banks fine, bright corn; and all the lower parts, though greater in ſtraw, yet little worth, by reaſon of the Mildew.

3. Dung made of ſtraw, I have obſerv'd, diſpoſed much to Mildew, and ſheeps-dung to be a kind of antidote againſt it; as alſo pigeons-dung: becauſe, I conceive, theſe two laſt ſorts abound much in nitre, which produces a firm, hard, bright corn, not eaſily to be putreſied; but the other being more oily and ſulphurous cauſeth a dark, ſpungy corn, ſoon corruptible.

And ſecondly, becauſe ſtraw is a part in the ſame kind corrupted, which is always in ſome meaſure hurtful to the ſame ſpecies, both in animals and all vegetables; and therefore rottenſticks, or the earth proceeding from them, is found hurtful to the roots of trees; and trees will hardly grow where roots of other trees have formerly been corrupted.

The remedies for this accident, briefly, are theſe. (Not to ſpeak of Bees, who certainly make moſt of their Honey from theſe Honies, or Mildews: for they gather very little in compariſon of that which falls).

1. The beſt way is to cut down the trees about your ground, and keep your hedges low, that the wind may ventilate your corn.

2. To ſow early, that your corn may be full kerned before theſe Mildews fall. I am informed, that an ingenious Knight in † *Kent*, did, for curioſity, ſow *Wheat* in all months of the year, and that ſown in *July* produced ſuch an increaſe that it is almoſt incredible: and truly I think it a great fault in many places, that they ſow late, for many reaſons. I am ſure in *France* they uſually ſow before *Michaelmas*.

3. Some uſe (and with good profit) to draw a line over their corn, and to ſtrike off the Mildew before 'tis thickened by the ſun. This ought to be done before ſun-riſing: two men in an hour will eaſily run over an acre. The Mildews uſually fall like a thick fog, or a miſty rain: if you go to your Bees, you will ſoon perceive it by their extraordinary labour, very early in the morning.

4. The uſe of a kind of bearded *Wheat* is an excellent remedy: for the beard ſhoves off the dew,

† Sir *Cheney Culp.*

dew, that it does not ſo eaſily inſinuate itſelf into the ear, and likewiſe cauſes the ear to ſhake by the leaſt wind. There is a kind of *Wheat* in *Buckinghamſhire* called red-ſtraw *Wheat*, which is much commended: it's a ſtrong-ſtalked *Wheat*, and doth not ſoon lodge, and therefore excellent for rank land, where corn is apt to lodge, and conſequently to Mildew; but I queſtion whether it hath any property againſt Mildew. This I am very confident of, that if this *Wheat*, or any other, were without the chaffy husks expoſed bare to the air, as *Barly* and *Rye* are, *Wheat* would not be afflicted with Mildew. Perhaps ſuch grain may be found by diligent enquiry. I have caſually pick'd out of a wheat-field ſome ſtalks, which had two ears on them: and though *Barly* uſually hath only two ranges, yet I have ſeen ſome ſorts with four or ſix, and there are great varieties in grain not yet diſcover'd. Truly, if any one knows betters ways than theſe, how to kill this malady of Mildew, he is much to blame if he does not publiſh it for the good of his country-men.

CHAP. VI.

Concerning the planting of Apples, Pears, Cherries, and Plums.

I Will not here ſet down the divers manners of Graftings and Inoculations, which nevertheleſs is an art abſolutely neceſſary in planting; for every book of Huſbandry doth ſhew it, and every Gardener can teach it to thoſe who are deſirous to learn it: neither will I ſet down all the ſorts of *Apples*, *Pears*, *Cherries*, *Plums*, &c.

for it would be too tedious, and Mr. *Parkinſon* hath already very excellently done it, in his book call'd *Paradiſus Terreſtris*; where at leiſure you may read. I will only point, briefly, at the Defects which I find in this part of Huſbandry, and the beſt ways to remedy them.

1. I ſay, that it is a great Defect in *England*, that we have not more Orchards planted. It is true, that in *Kent* and about *London*, and alſo in *Gloceſter*, *Hereford*, and *Worceſter* ſhires, there are many gallant Orchards; but in other counties they are very rare: But if there were as many more, even in any county, they would be very profitable. I know in *Kent*, that ſome advance their ground even from five ſhillings *per* acre to five pounds by this means; and if I ſhould relate what I have heard by divers, concerning the profit of a Cherry-orchard about *Sittenburn* in *Kent*, you would hardly believe me; yet I have heard it by ſo many, that I believe it to be true: namely, that an Orchard of twenty acres of *Cherries* produced, in one year, above a thouſand pound; but now the trees are almoſt all dead: It was one of the firſt Orchards in *Kent*. Mr. *Cambden* reports, that the Earl of *Leiceſter*'s Gardener, in Q. *Elizabeth*'s reign, firſt began to plant *Flemiſh Cherries* in thoſe parts; which, in his time, ſpread into ſixteen other pariſhes, and were then ſold at greater rates than now; yet I know that ten or fifteen pounds an acre hath been given for *Cherries*, more for *Pears* and *Apples*.

2. There is a great Defect in the ordering of Orchards, as being not well pruned, but full of *Moſs*, *Miſletoe* and *Suckers*; and oftentimes the ground is pack'd too thick of trees, for they ſhould ſtand at leaſt twenty feet aſunder: neither

ther will ill husbands bestow dunging, digging, or any other cost on Orchards, which if they did it might pay half their rents in some places. One told me, for a secret, a composition to make trees bear much and excellent fruit, which was this: first, in an old tree to split its root, then to apply a composition made of pigeons-dung, lees of wine, or stale urine, and a little brimstone, (to destroy the worms.) It hath some probability of truth; for by experience I know, that a bushel of pigeons-dung hath caused a tree to grow, and bear, which for divers years before stood at a stand; but concerning the splitting the roots, I know not what to say. Some old Authors affirm this ought to be done; because the roots may as well be hide-bound as other parts of the tree, and not able to attract its nourishment; and when the root is split it will speedily send forth divers small fibrous roots, which are the principal attractors. It were good that some would give us an exact account of this experiment. But some will object against Orchards, that they spoil much ground, and therefore ought to be planted only in hedges. To this I answer,

1. That *Plum-trees* and *Damsons* may very well be planted in hedges, being ordinarily thorny plants. This is used very much in *Surrey* and *Kent*; where the *Plums* usually pay no small part of the rent: yet I never saw, in these southern parts of *England*, any *Apples* or *Pears* thrive in an hedge, unless a *Crab* or a *Wilding*, or some *Sweeting*, of little worth. How they thrive in *Herefordshire* and those places, I know not.

2. The Inconveniences of Orchards planted at twenty or thirty feet distance, is not worth speaking

ſpeaking of: for this is the uſual courſe in *Kent*; when they plant any ground, they exactly place them in rank-and-file, and then plough their lands many years, and ſow them with corn, till the Orchard begins to bear fruit; then they lay them down for paſture, which paſture is not extraordinary ſour, but hath theſe advantages above other paſtures:

1. That it is ſooner grown by fourteen days in the ſpring than the meadows, and therefore very ſerviceable.

2. In parching ſummers here is plenty, when other places have ſcarcity.

3. They are great ſhelters for cattle, eſpecially ſheep, who will in thoſe places, in great ſnows, ſcrape up meat, which in other places they cannot do: and if the paſture were ſour, yet the loſs is not great, for it will be a convenient place for the hogs to run in; who muſt have a place for that purpoſe, where there are no commons.

4. I ſay, that the Benefits are ſo many by Orchards. They affording curious walks for pleaſure, and food for cattle, both in the ſpring early, and alſo in the parching ſummer, and nipping ſnowy winter: they afford fuel for the fire, and alſo ſhades from the heat, phyſick for the ſick, refreſhment for the ſound; plenty of food for man, and that not of the worſt; and drink alſo, even of the beſt: and all this without much labour, care, or coſt; who therefore can juſtly open his mouth againſt them?

A third Defect is, That we do not improve many excellent fruits, which grow among us very well; and that we have as yet many fruits from beyond ſea, which will grow very well with us. I paſs by the general and great ingorance that

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is amongſt us, of the variety of *Apples*, of which there are many ſorts which have ſome good and particular uſes; moſt men contenting themſelves with the knowledge of half a ſcore of the beſt, thinking the virtues of all the reſt are comprehended in them: as alſo of the variety of *Pears*, which are incredibly many. A Friend of mine, near *Graveſend*, hath lately collected about two hundred ſpecies. I know another in *Eſſex*, (Mr. *Ward*) who hath nigh the ſame number. I hear of another in *Worceſterſhire*, not inferior to theſe. In *Northamptonſhire* I know one who hath likewiſe collected very many. So that I dare boldly ſay, there are no leſs, in this iſland, than five hundred ſpecies; ſome commended for their early ripeneſs, ſome for excellent taſtes, ſome for beauty, others for greatneſs, ſome for great bearers, others for good bakers, ſome for long laſters, others for to make Perry, *&c.* But to our purpoſe. I ſay many rare fruits are neglected: for inſtance,

1. In the *Small-nut*, or *Filberd*, which is not much inferior to the beſt and ſweeteſt *Almonds*.

2. The great *Damſon*, or *Prune-plum*, which grows well and bears full in *England*.

3. *Almonds*, which grow well and bear good fruit: I have ſeen divers buſhels on one tree in my brother's orchard.

4. *Walnuts*, which is not a fruit to be deſpiſed.

5. *Vines* and *Mulberries*; but of theſe preſently, in another place. I might likewiſe add *Currants*, *Raſberries*, of which excellent drinks may be made.

6. *Quinces*. A Gentleman, at *Prichenel* in *Eſſex*, who had a tree from beyond ſea, hath the beſt in *England*, and hath made above thirty

ty pounds of a ſmall piece of ground planted with them, as I have heard from his own wife's mouth. And therefore it is by reaſon of our ill Huſbandry, that we have *Quinces* from *Flanders*, *Small-nuts* from *Spain*, *Prunes* from *France*, and alſo *Walnuts* and *Almonds* from *Italy*, and *Cheſt-nuts* (which I had almoſt forgot) from *Portugal*. And now I cannot but digreſs a little, to tell you a ſtrange and true ſtory, with my opinion of it. In divers places of *Kent*, as at and about *Graveſend*, in the country, and elſewhere, very many of the prime Timbers of their old barns and houſes are of *Cheſtnut-wood*, and yet there is ſcarce a *Cheſtnut-tree* within twenty miles of that place, and the people altogether ignorant of ſuch trees. This ſhews, that in former times thoſe places abounded with ſuch timber: for people were not ſo fooliſh ſurely in former times to run up and down the world, to procure ſuch huge maſſy timbers for barns, and ſuch buildings, whenas there was plenty of *Oaks* and *Elms* at their doors. And farther, it ſhews, that theſe trees will grow again with us to a great bigneſs. This puts into my mind the ſtory of the *Moor-logs*, which are found in divers places of the North of *England*, in *Moors* many foot deep; which logs are long and black, and appear to to be a kind of *Fir* or *Pine:* and yet in thoſe places people are altogether ignorant of theſe trees, the country not producing any of theſe ſpecies. The firſt ſtory of *Kent*, which I know to be true, cauſes me to wonder the leſs at the latter: for I ſee, that a ſpecies of wood may be deſtroy'd, even totally in a place. And,

I know, that in *Virginia* and *New-England*, *Pines*, *Firs*, and *Cedars*-trees grow wonderfully thick in ſuch Moors, or Swamps; and being light

light wood, and eaſily wrought, they are continually uſed, while they laſt, for buildings. Farther, I ſuppoſe theſe Moors were Commons, which the poor uſed to reſort to for firing; and how ſoon great woods will be conſumed by them, every one making what havock he pleaſes, all men know. As concerning their being ſo deep in the ground, I ſuppoſe, that when wood was abundant in thoſe places, every one cut what they pleaſed, and left what was not for their turns, which being in moiſt places was ſoon glutted with moiſture, and made ponderous; by which means it ſoon buried itſelf, as ſhips do on quickſands; or perhaps the turf (which hath a peculiar vegetative faculty, for where it is exhauſted, it ſoon grows again) in time hath grown over them; the people permitting it, becauſe wood, once ſobb'd in wet, is of little uſe, as we ſee by piles on the marſhes-ſide, ſcarce any man vouchſafing to carry them home. The blackneſs of this wood proceeds, as I ſuppoſe, from the ſooty fume, or evaporation of the black turf, (which endeavours, as all earths do, to reduce all things into its own nature; which though it be not able fully to accompliſh, yet it introduces divers diſpoſitions and qualities, as blackneſs in the wood.) Some ſuppoſe, that theſe *Moor-logs* have lain there ever ſince the Flood, with whom I will not contend, ſeeing that any wood, if it be kept from the air continually moiſt or dry, will endure even thouſands of years without putrefaction.

CHAP. VII.

Concerning the Defects of Fruits, in not improving them for the beſt ends and purpoſes.

Normandy, which produces but little wine, makes abundance of cider and perry, which they eſtimate equally to wine, if it be made of good fruit. The ordinary perry is made of *Choaky-pears*, very juicy, which grow along by the highway-ſides, which are not to be eaten raw. In *Biſcay* in *Spain*, where wine is ſcarce, they make cider of a certain ſweet *Apple*, which hath a little bitterneſs in it, and is like our *Snouting*; and the cider is very good. And truly here in *England*, if you would make cider and perry of the beſt ſorts of fruits, which is rarely done, (for we think any fruit good enough for that purpoſe) we might make drinks not inferior to the *French* wines, which are uſually ſpoil'd before they come to us, their ſpirits ſoon evaporating. There are two ways of making cider and perry: one, by bruiſing and beating them, and then preſently to put them in a veſſel to ferment, or work (as it is uſually called) of themſelves. The other way is, to boil the juice with ſome good ſpices, by which the rawneſs is taken away, and then to ferment it with ſome yeſt, if it works not of itſelf. This is the beſt way; and I have taſted cider thus made of an excellent delicate taſte. Neither let any complain of the windineſs; for it is only want of uſe. When I had, for two or three years, continually drank wine beyond ſea, the ſtrongeſt beer for two or three weeks was windy to me, as cider will be to any; and afterwards, when I went to *Paris*, the

the wine of that place was as troubleſome as *Engliſh* beer for a little time. How much wine might be ſaved, and alſo malt, if *Engliſh*-men would take thoſe good courſes which other nations do; and, conſequently, how much advantage would this iſland reap thereby? If I was an houſe-keeper in the country, I would make excellent Beer, Ale, Cider, Perry, Metheglin, and Wine of our own grapes, and if my friends would not drink theſe, they ſhould drink water, or go away thirſty. I would ſcorn to honour *France* ſo much as men uſually do; and the *Spaniards* and *Italians* ſhould not laugh at us, and ſay, That we can as well do without bread, as their wines, currants, *&c.* Thus may many other excellent drinks be made out of our fruits: not to ſpeak of thoſe which are made of our grain, as *Barly*, *Wheat*, &c. Yet, I muſt tell you, that I know an ingenious man, who can, without malting *Barly*, make a drink not inferior to wine, and a greater quantity of aqua-vitæ out of it, and with leſs coſt than the ordinary way, by a peculiar fermentation of his own; which time will diſcover. There is another ingenious man, who out of *Damſons*, and other ſweet *Plums*, can make a drink not inferior to the beſt wines, and abundance of aqua-vitæ. Many ladies know how to make *Cherry* and *Raſpes* wines: and Sir *Hugh Plattes*, in his *Cloſet for Ladies*, diſcloſeth many ſecrets of this kind; as alſo for Conſerves and Marmalades, which are things both delightful and profitable. I have a kinſman, who can even out of *Blackberries* make a very pleaſant drink; which curioſity he is unwilling to publiſh. *Glauber*, an excellent chymiſt, hath divers ſecrets of this kind, even to the advancing of *Haws*, *Hips*,

Canker-berries, *Slows*, to excellent aqua-vitæ's, drinks, and vinegars, which he himſelf firſt invented. In *Ruſſia*, in the ſpring-time, it's an uſual cuſtom to pierce the bark of the *Birch*-trees, which, at that time, will weep much liquor, and yet like children be little the worſe *: this the poor ordinarily drink for neceſſity; it's a pleaſant, healthful drink: and alſo the rich men, becauſe it's an excellent preſervative againſt the ſtone.

The means to advance this profitable and pleaſant work are theſe:

1. To raiſe nurſeries of all ſorts of *Apples*, *Pears*, *Plums*, *Cherries*, which Gentlemen may do for a ſmall matter, and then plant out theſe trees, when they are grown big enough. The beſt and cheapeſt way to raiſe all nurſery wares, is done thus: *Plums* may be raiſed either of ſtones, which, when you have eaten the *Plums*, may be preſently pricked into the ground; or by ſlips, which you may find about the old trees. *Apples* may be raiſed by kernels (*Crab*-kernels are the beſt) which ought to be preſerved in dry ſand till the ſpring, leſt they grow mouldy; or a *Crab*-ſtalk may be fetched out of the woods and grafted. Some trees, as *Sweetings*, *Codlings*, *Quinces*, will grow very well of ſlips. *Cherries* are very well raiſed by ſtones, (the *Black-Cherries* are the beſt,) which as ſoon as you have eat them, are to be howen into beds made very fine, the ranges a foot diſtant: beware leſt you let them heat, and take heed of the mouſe. I have ſeen *Cherry*-ſtones and *Apple*-kernels grow two foot and a half in one year; and, conſequently, in few years they would be fit to be tranſplanted.

The

* *Helmont.*

The Art of Grafting or Inoculating, a Gentleman will learn in two hours.

2. For the advancing of ingenuities in this kind, as that of making vinous-drinks out of *Apples*, *Plums*, &c. I adviſe all Gentlemen to try divers experiments in thoſe kinds, with the following cautions:

1. That they attempt not great quantities at firſt, which perchance will be chargeable and troubleſome; for by a gallon they may have as much certainty as by a hogſhead.

2. Not to be diſcouraged if they ſucceed not well at firſt daſh: for certainly there are many ingenuities in theſe fruits which time will diſcover.

3. Proceed by fermentation: for every liquor which will ferment, hath a vinous ſpirit in it, and without fermentation even the beſt fruits will have none.

Laſtly, fermentation is done either *in liquido*, or *humido*; and herein conſiſts ſome myſtery. I have forgot to ſpeak of *Apricocks*, *Peaches*, *Melicotores*, which are fine, pleaſant fruits, yet very dangerous; and therefore called by the *Italians*, *Mazzo-franceſe*, that is, *Kill-Frenchman*. I wiſh Ladies and others to take heed of ſurfeiting by theſe and ſome other dangerous *Plums*.

CHAP.

CHAP. VIII.

Concerning Vines.

I Cannot relate the various ſorts of *Vines*, which are even infinite; *Rome* having in it uſually forty or fifty ſorts of *Vines*, and all very good; other places of *Italy*, *Spain*, and *France* have alſo great variety: I therefore paſs them by, as alſo the manner of managing them, becauſe it is deſcribed in the *Country-Farm*, and alſo by *Bonovil*, a *Frenchman*, who, at the command of K. *James*, wrote a ſhort treatiſe of *Vines and Silk-worms*, for the inſtruction of the plantations of *Virginia*. I ſhall only, according to my method, ſhew you the Defects among us in this particular plant, and the beſt remedies for them.

And firſt, tho' I think wine is the great bleſſing of God, which hot countries eſpecially enjoy, as temperate countries do milk, butter, and cheeſe in abundance, and the coldeſt and barreneſt, fowl and fiſh in an incredible number; God of his goodneſs diſtributing ſome peculiar bleſſings to every country: Notwithſtanding, I dare ſay, it's probable, that vineyards have formerly flouriſhed in *England*, and that we are to blame, that ſo little is attempted to revive them again. There are many places in *Kent* call'd by the name of Vineyards, and the grounds of ſuch a nature, that it ſeems probable they have been ſuch. I hear farther, by divers people of credit, that by records it appears, that the tithe of wine in *Gloceſterſhire* was in divers pariſhes conſiderably great; but at length *Gaſcony* coming into the hands of the *Engliſh*, from whence

whence comes moſt of the ſtrong *French* wine, call'd high-country wine, and the cuſtom being ſmall, wine was imported into *England* from thence, better and cheaper than we could make it; and it was thought convenient to diſcourage vineyards here, that the greater trade might be driven with *Gaſcony*, and many ſhips might find imployment thereby.

Some fond aſtrologers have conceited, that the earth being grown older, and therefore colder, hath cauſed the ſun to deſcend many degrees lower to warm and cheriſh it; and one argument which they bring for this opinion, is, that *Vines* and *Silkworms* are found in thoſe countries, where in former times they were unknown. But if theſe fond men had conſidered the good huſbandry in theſe times, with the bleſſing of God on it, they had not run into ſuch fooliſh imaginations. This is true indeed, that the *Roman* ſoldiers, who had *Alſatia* given them to live in, which is one of the beſt and moſt ſouthern places of *Germany*, mutiny'd, becauſe they thought it ſo cold that *Vines* would not grow there, and that therefore they ſhould be deprived of that delectable liquor: whereas we find at this preſent day *Vines* flouriſhing many hundred miles more towards the north, both in *France*, *Lorrain*, and *Germany*; and that they are crept down even to the latitude of *England*; for the *Rheniſh*-wines grew within a degree of the weſt-ſouthern places of this iſle; and *Paris* is not two degrees ſouth of us, yet *Vines* grow threeſcore miles on this ſide *Paris*, as *Beaumont*; yea, the wines of theſe places are the moſt delicate; for what wine is preferred before the neat *Rheniſh* for ladies, and at table? And truly, in my opinion, though I have travelled twice through *France*,

France, yet no wine pleaſed me like *Vin d' Ache* and of *Paris*, eſpecially about *Rueill*, which is a very fine, briſk wine, and not fuming up to the head and inebriating, as other wines. I ſay therefore it is very probable, that if *Vines* have ſtept out of *Italy* into *Alſatia*, from them to theſe places, which are even as far north as *England*, and yet the wines there are the moſt delicate, they are not limited and bounded there: for one hundred miles, more or leſs, cauſeth little alteration in heat or cold, and ſome advantages which we have will ſupply that defect. But not to inſiſt too long on probabilities, I ſay, that in *England* ſome ingenious Gentlemen uſually make wine very good, and long laſting, without extraordinary labour and coſts. To inſtance in one †, who in *Great-Chart*, in the *Wild of Kent*, a place very moiſt and cold, yearly makes ſix or eight hogſheads, which is very much commended by divers who have taſted it; and he hath kept ſome of it two years, as he himſelf told me, and it has been very good. Others likewiſe in *Kent* do the ſame: and lately, in *Surrey*, a Gentlewoman told me, that they having many grapes, which they could not well tell how to diſpoſe of; ſhe, to play the good houſewife, ſtamp'd them to make verjuice; but two months after, drawing it forth, they found it very fine, brisk wine, clear like rock-water: and in many other places ſuch experiments have been made. I therefore deſire ingenious men to endeavour the raiſing of ſo neceſſary and pleaſant a commodity; eſpecially when *French* wine is ſo dear here, and I ſuppoſe is likely to be dearer; I queſtion not but they ſhall find good profit and pleaſure in ſo doing; and that the ſtate will give

† Sir *Peter Kicard.*

give all encouragement to them: and if the *French* wine pay exciſe and cuſtom, and the wines here are toll-free, they will be able to afford them far cheaper than the *French* can theirs, and ſupply the whole iſle, if they proceed according to theſe rules.

1. To chuſe the beſt ſorts of *Grapes*, which are moſt proper for this iſle; and tho' there are many ſorts of *Grapes* among Gardeners, yet I recommend four ſorts eſpecially to them: and I deſire that they be very careful in this particular; for it is the foundation of the work: if you fail in this, you fail in all; for I know that *Bourdeaux-Vines*, which bear very great grapes, make verjuice only at *Paris*, and that the tender *Orleans-Vine* doth not thrive there.

The firſt ſort is the *Parſely-Vine*, or *Canada-Grape*; becauſe it firſt came from thoſe parts, where it grows naturally: and tho' the country is intolerably cold, yet even in the woods, without manuring, it ſo far ripeneth this fruit, that the Jeſuits make wine of it for their maſs; and *Raiſiné* (which is the juice of the grape newly preſs'd and boil'd to a ſyrup, and is very ſweet and pleaſant) for their lent-proviſion, as you may read in their *Relations*. And this *Vine* ſeems to be made for theſe northern countries, becauſe it hath its leaves very ſmall and juicy, as if it were on purpoſe to let in the ſun; and it ripeneth ſooner than other grapes, as I have obſerv'd in *Oxford-Garden*.

The ſecond ſort of *Vine* is the *Rheniſh-Grape*; for it grows in a temperate country, not much hotter in ſummer than *England*; and the wine is excellent, as all know.

The third ſort is the *Paris-Grape*; which is much like the temper of *England*, only a

little hotter in ſummer. This *Grape* bears a ſmall bunch cloſe ſet together, very hardy to endure froſts and other inconveniences, and is ſoon ripe; ſo that the vintage of *Paris* is ſooner ended than that of *Orleans*, or *Bourdeaux:* and tho' it is not ſo delicate to the taſte, as ſome other grapes, yet it makes an excellent brisk wine.

The fourth ſort is the *Small-Muskadell*; which is a very fine pleaſant *Grape*, both to eat and to make wine. In *Italy* it uſually grows againſt their houſe-walls; and of this they make a ſmall, pleaſant wine, a month or two before the ordinary vintage. It is a tender plant in reſpect of the other *Vines* in the fields. Theſe *Vines*, I know, are the moſt convenient for this iſle, becauſe they bear ſmall bunches; and its grapes ſoon ripen, and are hardy to endure froſts and bad weather.

2. To chuſe convenient places. For this end I adviſe them, firſt, to plant *Vines* on the ſouth-ſide of their dwelling-houſes, barns, ſtables, and out-houſes. The Gentleman of *Kent*, whom I mention'd before, uſes this method; and to keep the *Vines* from hurting his tiles, and that the wind may not wrong them, he hath a frame made of poles, or any kind of wood, about a foot from the tiles, to which he ties the *Vines*; by this means his *Vines*, having the reflection of the yard, ſides of the houſes, and tiles, ripen very well, and bear ſo much, that one old *Vine* hath produced nigh an hogſhead of wine in one year. And I wiſh all to take this courſe; which is neither chargeable, nor troubleſome, but very pleaſant: and if all this iſland would do thus, it is incredible what abundance of wine might be made, even by this petty way.

3. If that any Gentleman will be at the charge of making a Vineyard, let him chuſe a fine, ſandy,

ſandy, warm hill, open to the ſouth-eaſt, rather than to the ſouth-weſt: for tho' the ſouth-weſt ſeems to be hotter, yet the ſouth-eaſt ripens better, as I have ſeen in *Oxford-Garden*; becauſe the ſouth-eaſt is ſooner warm'd by the ſun in the morning, and the ſouth-weſt winds are the winds which blow moſt frequently, and bring rain, which refrigerate the plants: and ſuch a place is very requiſite; for in other places *Vines* don't thrive, even in *France*: for if you travel betwixt *Paris* and *Orleans*, which is above thirty leagues, you ſhall ſcarcely ſee a vineyard, becauſe it is a plain, champion country. So likewiſe betwixt *Fontarabia* and *Bourdeaux*, in the ſouthern parts of *France*, for an hundred miles together; becauſe the land is generally a barren, ſandy plain, where only heath abounds and *Pine*-trees, out of which they make turpentine and roſin, by wounding of them; and tar and pitch, by the burning of them. And if any find ſuch a fine, warm hill, and dung and fence it well, he hath a great advantage of moſt of the vineyards of *France* by this conveniency, than they have of our iſle by being a hundred miles more ſouth; for moſt of their vineyards are in large fields not encloſed, on land that is ſtony, and but indifferently warm. But ſome will ſay, that the wet weather deſtroys us. It's true, that the wet will deſtroy all things; ſheep, corn, *&c.* yet no man will ſay, that therefore *England* will not produce and nouriſh theſe creatures; and if extraordinary wet years come, they ſpoil even the *Vines* in *France*. But take ordinary years, and our moiſture is not ſo great, (tho' ſome abuſe us, and call *England*, *Matula cæli*;) but the *Vines*, eſpecially thoſe I have mention'd before, will come to ſuch perfection as to make good

wine: and if extraordinary rains fall, yet we may help the immaturity by ingenuity, as I ſhall tell you anon; or at worſt make vinegar, or verjuice, which will pay coſts.

The following advantages we have of *France:*

1. This iſle is not ſubject to nipping froſts in *May*, as *France* is; becauſe we are in an iſle, where the air is more groſs than in the continent; and therefore not ſo piercing and ſharp, as it plainly appears by our winters, which are not ſo ſharp as in *Padua* in *Italy:* neither are we ſubject to ſuch ſtorms of hail in ſummer, which are very frequent in hot countries, and for many miles together ſpoil their *Vines*, ſo that they cannot make wine of the grapes: for thoſe grapes which are touched by the hail have a ſulphurous and a very unpleaſant taſte, and only fit to make aqua-vitæ. Farther; ſometimes in *France*, casks for their wines are ſo dear, that a tun of wine may be had for a tun of cask: and the cuſtom and exciſe which is laid on wines here, is as much again as the poor *Vigneron* of *France* expects for his wine. Not to ſpeak of the ill managing of their *Vines*, eſpecially about *Paris*; where poor men uſually hire an acre or two of *Vines*, which they manage at their ſpare hours, and moſt commonly pack in ſo many plants on their ground, for to have the greater increaſe, that the ground and *Vines* are ſo ſhaded by one another, that I have wonder'd that the ſun could dart in his beams to mature them. And therefore I cannot but affirm again, that we may make abundance of wine here with profit, the charges of an acre of vineyard not being ſo great as of *Hops:* an hundred ſets, well rooted, at *Paris* coſt uſually but four or ſix *ſous*, or pence; where I have bought many: two thouſand will plant an

acre

acre very well; fifty ſhillings a year is the ordinary rate for the three diggings with their crooked inſtrument call'd *Aventage*; and the increaſe uſually four tuns for an acre, which will be profit enough. And tho' I refer all to *Bonovil*, and others, who have written of the managing of *Vines*, I ſhould think it adviſeable to have a *Vigneron* from *France*, where there are plenty, and at cheaper rates than ordinary ſervants here, and who will be very ſerviceable alſo for gardening.

2. I will briefly tell what I have ſeen. In *Italy*, through all *Lombardy*, which is for the moſt part plain and champion, their *Vines* grow in their hedges on *Walnut*-trees, for the moſt part: in which fields they ſpeak of three harveſts yearly, *viz.*

1. *Winter-corn*, which is reaped in *June*, &c.

2. *Vines* and *Walnuts*, which are gathered in *September*.

3. Their *Summer-grains*, as *Millet*, *Panicle*, *Chiches*, *Vetches*, &c. *Buck-wheat*, *Frumenton*, or that which we call *Virginia-wheat*, and *Turnips*, which they ſow in *July* when their *Winter-corn* is cut and reap'd, they reap in *October*. In *France* their *Vines* grow three different ways: in *Provence* they cut the *Vine* about two foot high, and make it ſtrong and ſtubbed, like as we do our *Oſiers*; which ſtock beareth up the branches without a prop.

2. About *Orleans*, and where they are more curious, they make frames for them to run along.

3. About *Paris* they tie them to ſhort poles, as we do hops. In other parts of *France* they uſually make trenches, or ſmall ditches, about three or four foot from one another, and therein plant

plant their *Vines*, about one and a half deep; which is a good way, and very much to be commended: but if we, here in *England*, plant *Vines* as we do *Hops*, it will do very well, but let them not be pack'd together too thick, as they do in *France* in many places, leſt they too much ſhade the ground, and one another. In *Italy* when they tread their grapes with their feet in a cart, they pour the juice into a great veſſel, or fat, and put to it all their husks and ſtones, which they call *graſp*, and let them ferment, or (as we ſay) work together twelve or fourteen days, and uſually they put one third of water to it; this makes a wine leſs furious, *garbo* or rough, and therefore a good ſtomach-wine; but it ſpoils the colour, and takes away the pleaſant, brisk taſte. In *France* ſo ſoon as they have preſſed out their liquor with their feet, they put it in hogſheads, and after in their preſs ſqueeze out what they can, out of the graſp; which ſerves to fill up their hogſheads while they work, which is uſually three or four days, and then they ſtop them cloſe. This is alſo the way uſed in *Germany*; and is the beſt, for it makes a fine, gentle wine, with a curious colour. In *Germany*, when the grapes are green, they make a fire in their cellars in ſtoves, by which means their wines work extraordinarily, and digeſt themſelves the better. This courſe we muſt alſo take here in *England* ſome years; for it helps the rawneſs of all liquors very much. There is an ingenious *Dutchman* † who hath a ſecret, which as yet he will not reveal, how to help maturation, by a compoſition applied to the roots. The compoſition which I have ſpoken of before, made of brimſtone and pigeons-dung, is excellent for that pur-

† *Glauber.*

purpoſe; as alſo lees of wine, blood, and lime uſed with moderation. He alſo knows how to make ſour grapes produce good wine: I ſuppoſe his way to be this; all juice of grapes newly ſqueezed is ſweet, and which may by itſelf alone be made into a ſweet ſyrup, which the *French* call *Raiſiné*. Farther, in the evaporation of liquors, which have not fermented, or wrought, the watery part goes away firſt.

3. Fermentation gives a vinous taſte, and makes a liquor full of ſpirits.

You may then eaſily gueſs at the way, and perhaps he may add alſo ſome ſugar and ſpices, as the vintners do when they make Hippocras. I know a Gentleman, who hath made excellent wine of raiſins, well boiled in water, and afterwards fermented by itſelf, or with barm; it is uſually call'd Mead. I likewiſe know, that all ſweet juices will make fine vinous liquors, as *Damſons*, if they be wrought or fermented ingeniouſly: but whoſoever goes about ſuch experiments, let him not think that any thing is good enough for theſe purpoſes; but let him uſe the beſt he can get: for of naughty, corrupt things, who can expect they'll produce that which is excellent and delicate?

CHAP.

CHAP. IX.

Concerning Hemp and Flax.

THE Defect of us in this kind is so obvious, that all the world takes notice of it, and it is (next the neglect of fishing) the greatest shame to the nation; for all know that we have as good land for these seeds, as any in *Europe*; and that the sowing of them requires neither more labour, cost, or skill than other seeds; and that the materials made from these are extreamly necessary: For how miserable should we be without linnen, canvasses, cordage, and nets? How can we put our ships to sea, which are the bulwarks of this isle? And yet we are necessitated to have these commodities from those who would destroy (I will not say the nation, but I may boldly say) our shipping and trade. I hope that this will more seriously be considered by those at the Helm of our State. I will freely and plainly relate how this Defect may easily be remedied, according to my judgment:

1. To compell by a law, that all farmers who plough and sow fifty or one hundred acres of land, should sow half an acre or an acre of *Hemp* or *Flax*, or pay five or ten shillings to the poor of the parish where they live: or some law to this purpose: for there is no man but hath land fit for one of these, *Hemp* requiring a stiff land, *Flax* light land.

In K. *Edward* the VIth's days, something was enacted to this purpose. In *Henry* the VIIIth's reign, there was a law enacted, that every man should sow his lands, and that no man should enclose them, lest he should turn 'em to pasture,

ſture, (for we have had great dearth in *England* thro' the neglect of tillage ;) which laws are ſtill in force. But there need not any force now to compell men to till and ſow their lands, for they have at length found the ſweetneſs, and willingly go about it for their own profit's ſake, and now we ſuppoſe (and not without cauſe) that encloſing is an improvement. And concerning *Hemp* and *Flax*, I ſay, if they were once accuſtomed to ſow them, they would never leave it, as I ſee farmers do in Eaſt-*Kent*, ſcarce a man but he will have a conſiderable plot of ground for *Hemp*, and about *London* far greater quantities of *Flax* is ſown than formerly.

2. It is convenient that every pariſh through the nation ſhould have a ſtock to ſet their poor to work, that the young children and women might not run up and down idle, and begging or ſtealing (as they do in the country) of Apples, Peaſe, Wood, Hedges, and ſo by little and little are train'd up for the Gallows.

3. That a ſevere law ſhould be enacted againſt thoſe who run up and down, and will not work: for if all knew that they may have work at home, and earn more within doors, honeſtly, than by running roguing up and down, why ſhould they not compell them to it? And tho' ſome may think the pariſhes will loſe much by this way, becauſe that the ſtock wrought will not be put off but with loſs, as perhaps ten pounds will be brought to eight pounds ; yet let them conſider how much they ſhall ſave at their doors, how many inconveniencies they are freed from ; their hedges in the country ſhall not be pulled, their fruits ſtoln, nor their corn purloined : and farther, that the poor will be trained up to work, and therefore fit for any ſervice ;

vice; and in their youth learn a calling, by which they may get an honeſt livelyhood; and I dare ſay, their aſſeſſments for the poor would not be ſo frequent, nor the poor ſo numerous: and the benefit which would redound to the nation would be very great.

4. The charitable deeds of our forefathers ought to be enquired after, that they be not miſplaced, as uſually they are, but be really beſtow'd for the good of the poor that are laborious, as in *London* is begun; and if there be any that will not work, take St. *Paul*'s rule, who beſt knew what was beſt for them. I dare not adviſe to take in part of Commons, Fens, *&c.* and to improve them for this uſe, leſt I ſhould too much provoke the rude mercileſs multitude. But to return to my diſcourſe. I ſay, that ſowing *Hemp* and *Flax*, will be very beneficial:

1. To the owners of land: for men uſually give in divers places three pounds *per* acre, to ſow *Hemp* and *Flax* (as I have ſeen at *Maidſtone* in *Kent*, which is the only place I know in *England* where thread is made; and though nigh a thouſand hands are imploy'd about it, yet they make not enough for this nation) and yet get good profit. How advantageous will this be to thoſe who have drain'd the *Fens*, where doubtleſs *Hemp* will flouriſh and thicken the ground; (for *Hemp* deſires ſtiff, moiſt land, as *Flax* light and dry:) and likewiſe to thoſe in the North of *England*, where land is very cheap? I hope in a little time *Ireland* will furniſh us with theſe commodities, if we be idle; for land there is very cheap, and thoſe ſeeds need no incloſure; for cattle will not touch them, neither doth it fear the plunderer, either in the field or barn.

2. It's

2. It's profitable to the ſower. I know that they uſually value an acre at ten or twelve pounds, which coſts them uſually but half the money. Whether there be *Flax* that will yield thirty or forty pounds *per* acre, as ſome report, I know not.

3. To the place where it is ſown; becauſe it ſets many poor to work. I wiſh it were encouraged more in the North than it is; becauſe there is many poor, who would willingly take pains; and though ſpinning of linnen be but a poor work, yet it is light, and may be called womens recreation, (and in *France* and *Spain* the beſt citizens wives think it no diſgrace to go about ſpinning with their rocks;) and though in ſome parts the poor think it nothing to earn four or ſix pence a day, and will as ſoon ſtand with their hands in their pockets as work cheap; yet in the North they account it well to earn three pence or four pence by ſpinning, which they may do.

Laſtly, it would be very beneficial to this nation, and ſave many thouſand pounds, I may ſay hundred thouſands, which are exported, either in caſh or good commodities; and we ſhould not be beholden to *Holland* for fine Linnen and Cordage, nor to *France* for Poldavices, Locram, Canvaſſes or Nets, nor to *Flanders* for Thread; but might be ſupply'd abundantly with theſe neceſſary commodities even at our own doors.

CHAP. X.

Concerning Dunging and Manuring Lands.

THERE is no ſmall Defect in dunging and manuring lands, becauſe that all manner of manuring and amending lands is not known to every one, and alſo they do not imploy all they know to the beſt uſe. I will therefore ſet down moſt of the ways I have ſeen in *England* and beyond ſea, by which land is improved, and the beſt ways to uſe the ſame.

1. To begin with Chalk, which is as old a way as *Julius Cæſar*'s time, as he himſelf reporteth in his *Commentaries*. Chalk is of two ſorts:

Firſt, a hard, ſtrong, dry Chalk, with which in *Kent* they make walls, burn lime, *&c.*

Second kind is a ſmall, unctuous Chalk: this is the Chalk for land, the other helps little; only it makes the plough go eaſier in ſtiff lands. Broomy land is accounted the beſt land for Chalk and Lime, but it helps other lands alſo; eſpecially if you Chalk your ground, and let it lie a year or two, which is the way uſed in *Kent*, that it may be matured and ſcatter'd by the ſun and rain, otherwiſe if it be turned in preſently, it is apt to lie in great clods, as I have ſeen it twenty years after. Chalk alſo ſweetens paſture, but doth not much increaſe it, and kills ruſhes and broom.

2. Lime, which is made of divers ſorts of ſtones, is an excellent thing for moſt lands, and produces a moſt pure grain. One hundred and ſixty buſhels is uſually laid on an acre; but I ſuppoſe, if men laid but half the dung on the ground

ground as they uſually do, as alſo lime and chalk, and dung and lime it oftener, it would be better huſbandry: for much dung cauſes much weeds, and cauſes corn to lodge; and too much chalk forces the land too much; ſo that after ſome good crops it lies barren many years. It's good huſbandry likewiſe to lay down lands before they be too much out of heart; for they will ſoon recover; otherwiſe not.

3. Ordinary Dung, which every one knows: let it not be expoſed to the ſun too much, nor let it lie in a high place; for the rain will waſte away its fatneſs. It's obſervable, that earth the more it is expoſed to the ſun the better it is; as we ſee land is much improv'd by often ploughing, for the ſun and dew engender a nitrous fatneſs, which is the cauſe of fertility; but dung is exhauſted by the ſun, as it appears by the folding of ſheep, which profits little if it be not preſently turned in; therefore a ſhepherd, if his time would permit, ſhould turn up the ground with an how to ſow *Turnips*, as Gardeners do. I have ſeen ordinary Dung on dry lands in dry years to do hurt, and often cauſes weeds and trumpery to grow.

4. Marl. It's of divers kinds: ſome ſtony, ſome ſoft, ſome white, ſome yellowiſh, but commonly blew. It's in moſt places in *England*, but not known by all: the beſt marks to know it, is to expoſe it to the air, and to ſee if the ſun or rain cauſe it to ſhatter, and if it be unctuous; or rather to take a load or two, and lay it on the midſt of your fields, and to try how it mendeth your lands. It's excellent for corn and paſture, eſpecially on dry lands. In *Eſſex* the ſcourings of their ditches they call Marl, be-

cauſe

cauſe is looks blew like it; it helps their lands well.

5. Snaggreet: which is a kind of earth taken out of the rivers, full of ſmall ſhells. It helps the barren lands in divers parts of *Surrey*. I believe it's found in all rivers. It were well, if in other parts of *England* they took notice of it.

6. Owſe out of marſh ditches has been found very good for white chalky land: as alſo Sea-mud and Sea-owſe is uſed in divers parts of *Kent* and *Suſſex*.

7. Sea-weeds.

8. Mr. *Carew*, in his *Survey of Cornwall*, relates, that they uſe a fat Sea-ſand, which they carry up many miles in ſacks; and by this they have very much improved their barren lands. It is worth the while to try all Sea-ſands: for I ſuppoſe, that in other places they have a like fertilizing quality.

9. Folding of Sheep, eſpecially after the *Flanders* manner, *viz.* under a covert, in which earth is ſtrew'd about ſix inches thick, on which they ſet divers nights: then more earth muſt be brought and ſtrew'd ſix inches thick, and the ſheep folded on it; and thus they do continually winter and ſummer. I ſuppoſe a ſhepherd, with one horſe, will do it at his ſpare hours, and indeed ſooner than remove his fold; and this folding is to be continued, eſpecially in winter, and doth the ſheep good; becauſe they lie warm and dry. And truly, if I am not miſtaken, by this means we may make our ſheep to enrich all the barren dry lands of *England*.

10. Aſhes of any kind: Seacoal-aſhes with Horſe-dung the gardeners of *London* much commend for divers uſes. It's great pity that ſo many

many thouſand loads are thrown into waſte places, and do no good.

11. Soot is alſo very good, being ſprinkled on ground; but it's too dear, if it be of wood, for it's worth ſixteen pence or two ſhillings a buſhel.

12. Pigeons or Hens-dung is incomparable: one load is worth ten loads of other dung, and therefore it's uſually ſown on *Wheat* that lies afar off, and not eaſy to be help'd: it's extraordinary likewiſe on a hop-garden.

13. Malt-duſt is exceeding good in corn-land: Blood for trees; alſo Shavings of Horns.

14. Some commend very much the Sweepings of a ſhip of Salt, or droſſy Salt and Brine: it's very probable, becauſe it kills the worms; and all fertility proceeds from Salt.

15. I have ſeen in *France* poor men cut up *Heath*, and the *Turf* of the ground, and lay them on a heap, to make Mould for their barren lands. *Braks* laid in a moiſt place, and rotted, are uſed much for Hop-grounds, and generally all things that will rot, if they were ſtones, would make dung.

16. In *New-England* they *fiſh* their ground, which is done thus: In the ſpring, about *April*, there comes up a fiſh to the freſh rivers, called an *Alewife*, becauſe of it's great belly, and is a kind of ſhad, full of bones: theſe are caught in wiers, and ſold very cheap to the planters, who uſually put one or two cut in pieces into the hill where their corn is planted, called *Virginia-wheat*, for they plant it in hills, five grains in an hill, almoſt as we plant *Hops* (in *May* or *June*, for it will not endure froſts) and at that diſtance: it cauſes fertility extraordinary for two years, eſpecially the firſt; for they have had fifty

fifty or ſixty buſhels on an acre, and yet plough not their land; and in the ſame hills plant the ſame corn for many years together, and have good crops; beſides abundance of *Pompions*, or *French Kidney-beans*. In the North parts of *New-England*, where the fiſher-men live, they uſually *fiſh* their ground with Cods-heads; which if they were in *England* would be better imploy'd. I ſuppoſe that when Sprats are cheap, men might mend their Hop-grounds with them, and it would quit coſt: but the dogs will be apt to ſcrape them up, as they do in *New-England*, unleſs one of their legs be tied up.

17. Urine. In *Holland* they as carefully preſerve the cows urine, as the dung, to enrich their land: old urine is excellent for the roots of trees. *Columella*, in his book of *Huſbandry*, ſaith, that he is an ill huſband that doth not make ten loads of dung for every great beaſt in his yard, and as much for every one in the houſe, and one load for ſmall beaſts, as hogs. This is ſtrange huſbandry to us: and I believe there are many ill huſbands by this account. I know a woman who lives five miles ſouth of *Canterbury*, who ſaves in a pail, all the droppings of the houſes, I mean the urine, and when the pail is full, ſprinkles it on her meadow, which cauſes the graſs at firſt to look yellow, but after a little time it grows wonderfully, that many of her neighbours wonder'd at it, and were like to accuſe her of witch-craft.

18. Woolen-rags; which *Hertfordſhire* men uſe much, and *Oxfordſhire*, and many other places: they do very well in thin, chalky land in *Kent* for two or three years. It's a fault in many places, that they neglect theſe, as alſo Linnen-rags, or Ropes-ends, of which white and brown

brown paper is made. It's ſtrange that we have not Linen-rags enough for paper, as other nations have; but muſt have 'em from *Italy*, *France*, and *Holland*.

19. *Denſhyring** (ſo called in *Kent*, where I only have ſeen it uſed, though by the word it ſhould come from *Denbighſhire*,) is the cutting up of all the turf of a meadow, with an inſtrument ſharp on both ſides, which a man with violence thruſts before him, and then lays the turf on heaps, and when it's dry they burn it, and ſpread it on the ground. The charge is uſually four nobles an acre, which the goodneſs of a crop or two repays.

20. Mixture of lands. *Columella*, a famous old writer, ſays, that his grandfather uſed to carry ſand on clay, and on the contrary to bring clay on ſandy grounds, and with good ſucceſs. Lord *Bacon* † thinks much good may be done thereby; for if chalk be good for loamy land, why ſhould not loam be good for chalky banks?

21. I may add Encloſure as an improvement of land: not only becauſe that men, when their grounds are encloſed, may imploy them as they pleaſe; but becauſe it gives warmth, and conſequently fertility. There is one in *London*, who promiſed to mend lands much by warmth only, and we ſee that if ſome few ſticks lie together, and give a place warmth, how ſpeedily that graſs will grow.

22. Steeping of grains. The Ancients uſed to ſteep *Beans* in ſalt-water: and in *Kent* it's uſual to ſteep *Barly*, when they ſow late, that it may grow the faſter; and alſo to take away the ſoil: for wild *Oats*, *Cockle*, and all, ſave *Drake*, will ſwim; as alſo much of the light corn, which

* Mr. *Cambden*. † *Natural Hiſtory*.

to take away is very good. If you put Pigeons-dung into water, and let it ſteep all night, it may be as good as half a dunging. Take heed of ſteeping *Peaſe* too long; for I have ſeen them ſprout in three or four hours.

23. Is the ſowing of coarſe and cheap grain, and, when they are grown, to plough them in. For this purpoſe the Ancients uſed *Lupines*, a plant well known to our gardeners: and in *Kent* ſometimes *Tares* are ſown, which when the cattle have eaten a little of the tops, they turn them in, with very good improvement for their ground.

CHAP. XI.

Concerning the Improvement of our Meadows.

I Will not deny but we have good huſbands, who dung and marl their Meadows and Paſture-land, and throw down all mole and ant-hills, and with their ſpud-ſtaff cut up all thiſtles and weeds; and that they likewiſe ſtrow aſhes on their ground to kill the *Moſs*, and ſalt for the worms, and they do very well; but yet there are many who are negligent in theſe particulars, for which they are blame-worthy: but the Defects of which I intend to ſpeak of, are theſe following. *Cato*, one of the wiſeſt of the *Romans*, ſaith, that *pratum eſt, quaſi paratum; always ready, and prepared*; and prefers Meadows before the *Olive*-gardens, (altho' the *Spaniards* bequeath *Olive*-trees to their children, as we do cottages, or *Vines*, or corn; becauſe Meadows bring in a certain profit) without labour and pains, but the other requires much coſt and pains, and are ſubject to froſts, mildew, hail, and locuſts: but for

for the honour of Meadows, I may add, the ſtock of Meadows is of greater value, and the commodities which ariſe from them are divers, and of greater value than corn, as butter, cheeſe, tallow, hides, beef, and wool; and therefore I may conclude, that *England* abounding in Paſtures more than other countries, is therefore richer; and I know (what others think I care not) that in *France* acre for acre is not comparable to it. *Forteſcue*, Chancellor of *England*, ſaith, that we get more in *England* by ſtanding ſtill, than the *French* by working. But to ſpeak of the Defects amongſt us.

1. We are to blame, that we have neglected the great *Clover-graſs*, *Saint Foin*, and *Lucerne*.

2. That we do not float our lands, as they do in *Lombardy*, where they mow their lands three or four times yearly, which conſiſt of the great *Clover-graſs*. Here the excellent *Parmiſan*-cheeſes are made; and indeed theſe paſtures far exceed any other places in *Italy* and all *Europe*. We, in *England*, have great opportunities by brooks and rivers in all places to do ſo; but we are negligent: yet we might hereby double, if not treble our profits, kill all ruſhes, *&c.* But he that deſires to know the manner how to do this, and that profit that will ariſe thereby, let him read Mr. *Blith*'s book of Huſbandry, lately printed.

3. That when we lay down land for Meadow, or Paſture, we do not ſow them with the ſeeds of fine ſweet graſs, *Trefoil*, and other excellent herbs. Concerning this you may read a large *Treatiſe* of the *Country-Farmer*; for if the land be rich, it will put forth weeds and trumpery, and perhaps a kind of ſour graſs little worth; if it be poor, ye ſhall have thiſtles, *May*-weed,

and little or no graſs for a year or two. I know a Gentleman, who at my entreaty ſowed the bottom of his *Hay-mow* with *Oats*; and tho' his land were worn out of heart, and naturally poor, yet he had that year not only a crop of *Oats*, but he might, if it had pleaſed him, have mowed his graſs alſo; but he ſpared it, which was well done, till the next year, that it might make a turf and grow ſtronger. By this huſbandry lands might be well improved; eſpecially if men did conſider the diverſity of graſſes, which are ninety ſorts, and twenty three of *Trefoil*. I know a place in *Kent*, which is a white chalky-down, which ground is ſometimes ſown with corn a year or two, and then it reſts as long or longer: when it is laid down it maintains many great ſheep, and very luſty, fit for the butcher; and yet there ſcarce appears any thing that they can eat, which hath cauſed divers to wonder, as if they had lived on chalk-ſtones. But I more ſeriouſly conſidering the matter, thoroughly viewed the ground, and perceiv'd that it naturally produced a ſmall *Trefoil*, which it ſeems is very ſweet and pleaſant; it's commonly call'd *Trefolium luteum*, or *Lupilinum*, that is, *yellow* or *Hop-Trefoil:* and I am perſuaded, if the ſeed of this *Trefoil* were preſerv'd, and ſown with *Dates*, when they intend to lay it down, it would very much advance the Paſture of that place; therefore I deſire all ingenious men ſeriouſly to conſider the nature of the *Trefoils*, which are the ſweeteſt of graſſes, and to obſerve on what grounds they naturally grow, and alſo the nature of other graſſes, which (as I have ſaid before) are no leſs than ninety ſorts naturally growing in this iſle; ſome on watry places, ſome on dry, ſome on clay,

clay, others on ſand, chalk, *&c.* ſome on fruitful places, others in barren; by which means, I ſuppoſe, a ſolid foundation might be laid for advancing the Paſture-lands of all ſorts thro' the iſland: for I know ſome plants, as the *Orchis*, call'd *Bee-flower*, &c. which will thrive better on chalky, barren banks, than any garden, tho' the mould be never ſo rich and delicate, and the gardener very diligent to cheriſh it: and why may not the ſame property be in graſſes? For we ſee divers benty graſſes to thrive, eſpecially on barren places, where ſcarce any thing elſe will grow. I muſt again and again deſire all men to take notice of the wonderful graſs which groweth near *Saliſbury*, and deſire them to try it on their rich Meadows.

CHAP. XII.

Concerning Waſte Land.

IT is a common ſaying, that there are more waſte lands in *England*, in theſe particulars, than in all *Europe* beſides, conſidering the quantity of land. I dare not ſay this is true; but hope if it be ſo, that it will be mended. For of late much has been done for the advancement of theſe kinds of lands; yet there are ſtill great Defects. In the times of popery all in the iſland were either ſoldiers or ſcholars; ſcholars, by reaſon of the great honours, privileges, and profits, the third part of the kingdom belonging to them; and ſoldiers, becauſe of the many and great wars with *France*, *Scotland*, *Ireland*, *Wales*, &c. And in thoſe times gentlemen thought it an honour to be careleſs, and to

have

have houſes, furniture, diet, exerciſes, apparel, *&c.* yea all things at home and abroad, ſoldier-like: muſick, pictures, perfumes, ſauces, (unleſs good ſtomacks) were counted, perhaps unjuſtly, too effeminate. In Queen *Elizabeth*'s days, ingenuities, curioſities, and good huſbandry began to take place, and then Salt Marſhes began to be fenced from the ſea; and yet many were neglected, even to our days, as *Hollhaven* in *Eſſex*, *Axtelholm-Iſle* in *Yorkſhire*. Many thouſand acres have lately been gain'd from the ſea in *Lincolnſhire*, and yet more are to be taken in there and in other places. *Rumſey-marſh* in *Kent*, conſiſting of 45,000 acres and upwards, as *Cambden* relates, is of ſome antiquity, where the land is uſually lett for thirty ſhillings per acre, and yet one penny per week conſtantly is paid, through the whole level, for the maintenance of the wall, and now and then two pence: whereas ordinary ſalts are accounted dear at five or ſix ſhillings per acre; ſo that the improvement is very conſiderable: the ſame I may ſay of *Fens*, eſpecially that great *Fen* of *Lincoln*, *Cambridge*, and *Huntingdon* ſhires, conſiſting, as I am inform'd, of 380,000 acres, which is now almoſt recovered; and a friend of mine told me very lately, that he had offer'd a mark per acre for nine hundred acres together, to ſow *Rape* on, which formerly was ſcarcely valued at one ſhilling per acre. Very great therefore is the improvement of draining of lands, and our negligence very great, that they have been waſte ſo long, and as yet ſo continue in divers places: for the improving a kingdom is better than the conquering a new one.

2. I ſee likewiſe no ſmall faults in this land, by having ſo many Chaces and Foreſts, where brambles,

brambles, brakes and furzes grow; whereas theſe trumperies might be cut up, and pot-aſhes made of them, and the ground imploy'd profitably for corn, or paſture. I know a foreſt by *Brill*, in *Buckinghamſhire*, taken in, and the land is uſually lett, being now well encloſed, for four or five nobles per acre.

3. Sort of waſte land is dry, heathy Commons. I know that poor people will cry out againſt me, becauſe I call theſe waſte lands; but it's no matter: I deſire ingenious Gentlemen ſeriouſly to conſider, whether or no theſe lands might not be improved very much by the huſbandry of *Flanders*, *viz.* by ſowing *Flax*, *Turnips*, great *Clover* graſs, if that manure be made by folding ſheep after the *Flanders* way, to keep it in heart?

4. Whether the rottenneſs and ſcabbineſs of ſheep, murrain of cattle, diſeaſes of horſes, and in general all diſeaſes of cattle, do not generally proceed from Commons?

5. If the rich men, who are able to keep great ſtocks, are not great gainers by them?

6. Whether Commons do not rather make poor, by cauſing idleneſs, than maintain them; and ſuch poor, who are train'd up rather for the gallows or beggary, than for the commonwealth's ſervice?

7. How it comes to paſs, that there are feweſt poor where there are feweſt Commons, as in *Kent*, where there is ſcarce ſix Commons in the county of conſiderable bigneſs?

8. How many do they ſee enrich'd by the Commons; and if their cattle be not uſually ſwept away by the rot, or ſtarv'd in ſome hard winters?

9. If

9. If poor men might not imploy two acres encloſed to more advantage than twice as much in a Common?

10. And laſtly, if all Commons were encloſed, and part given to the inhabitants, and part rented out, for a ſtock to ſet all the poor to work in every county? I determine nothing in this kind, but leave the determination for wiſer heads.

Parks. Though I can't but reckon Parks amongſt lands which are not improv'd to the full, but perceive conſiderable waſte by them, by brakes, buſhes, brambles, *&c.* growing in divers places, and therefore wiſh there were fewer in this iſland; yet I am not ſo great an enemy to them as moſt are, for there are very great uſes of them; as,

1. For the bringing up of young cattle.

2. For the maintaining of timber; ſo that if any have occaſion to uſe a good piece of timber, either for a mill-poſt, or a keel of a ſhip, or other ſpecial uſes, whither can they go but to a Park?

3. The ſkins of deer are very uſeful, and their fleſh excellent food. Not to ſpeak of the medicinal uſes, nor of acorns for hogs, *&c.* But ſome will object, that the plough never goes there. To which I anſwer, it's no matter; for I cannot but ſay, as *Forteſcue* chancellor to *Henry* VI. did, That God hath given us ſuch a fruitful land, that without labour we have plenty: whereas *France* muſt dig and delve for what they have. And I ſuppoſe, that I could maintain two things which are thought great paradoxes, *viz.* that it were no loſs to this iſland, if we did not plough at all, if we were certain of having corn

corn at a reaſonable rate, and likewiſe vent for all our manufactures of wool.

1. Becauſe the commodities from cattle are far more ſtable than corn; for cloth, ſtuffs, ſtockings, butter, cheeſe, hides, ſhoes, tallow, *&c.* are certain every where; corn ſcarcely in any place, conſtantly in none.

2. Paſture imploys more hands, which is the ſecond paradox; and therefore paſture doth not depopulate, as it is commonly ſaid; for *Normandy* and *Picardy* in *France*, where there are paſtures in a good meaſure, are as populous as any part of *France:* and I am certain, that *Holland*, *Friezland*, *Zealand*, *Flanders* and *Lombardy*, which rely altogether on paſture, are the moſt populous places in *Europe*. But ſome will object and ſay, that a ſhepherd and a dog formerly have deſtroy'd divers villages. To this I anſwer, that we know what a ſhepherd and a dog can do, *viz.* look to two or three hundred ſheep at moſt, and that two or three hundred acres will maintain them, or the land is extreamly barren; and that theſe two or three hundred acres, being barren, will ſcarcely maintain a plough, (which is but one man and two boys,) with the horſes: and that the mowing, reaping, and threſhing of this corn, and other work about it, will ſcarcely maintain three more with work thro' the whole year. But how many people may be employ'd by the wool of two or three hundred ſheep, in picking, ſorting, carding, ſpinning, weaving, dying, fulling, and knitting, I leave to others to calculate. And farther, if the paſtures be rich meadows, and go on dairying, I ſuppoſe all know, that one hundred acres of ſuch land imploys more hands than one hundred acres of the beſt corn-land in *Eng-*

land, and produces likewiſe better exportable commodities. And farther, if I ſhould grant, that formerly the ſhepherd and his dog did depopulate, yet I will deny that they do ſo now: for formerly we were ſo unwiſe as to ſend over our wools to *Antwerp*, and other places, where they were manufactur'd; by which means one pound often brought ten unwrought to them; but we ſet now our own poor to work, and ſo ſave the depopulation. Yet, I ſay, it's convenient to encourage the plough, becauſe we cannot have a certainty of corn, and carriage is dear, both by ſea and land, eſpecially into the inland countries, and our commodities by wool cloy the merchants.

4. Ruſhy Lands. *Blith* tells us good Remedies for theſe inconveniences, *viz.* making deep trenches, often mowing, chalking, liming, dunging and ploughing.

5. Furze, Broom and Heath. Theſe can hardly be deſtroy'd, but at length they will up again; for God hath given a peculiar propriety to every kind of earth, to produce ſome peculiar kinds of plants, which it will obſerve even to the world's end, unleſs by dung, marle, or chalk you alter even the very nature of the earth. In *Gallicia*, in *Spain*, where ſuch barren lands very much abound, they do thus; firſt, they grub them up as clean as they can; of the greater roots and branches they make fire-wood; the ſmaller ſticks are either imploy'd in fencing, or elſe are burnt on the ground; afterwards the land being plough'd twice, at leaſt, they ſow *Wheat*, and uſually the crop is great, which the landlord and tenant divide according to a compact; then the ground reſts, and in three or four years the *Furze* or *Broom* will recover their former

mer growth, which the painful huſbandman grubbeth, and does with it as formerly. I ſet this down, that you may ſee how laborious the *Spaniard* is in ſome places, the poverty of the country compelling him to it.

6. There are other inconveniences in land, beſides weeds and trumpery, *viz.* ill tenures, as copy-hold, knight-ſervice, *&c.* ſo that the poſſeſſor cannot cut any timber down without conſent of the Lord; and when he dies muſt pay one or two years rent. But theſe are not in the power of the poor huſbandman to remedy; I therefore paſs them by; yet hope that in little time we ſhall ſee theſe inconveniences remedied; becauſe they much diſcourage improvement, and are (as I ſuppoſe) badges of our *Norman* ſlavery.

To conclude; it ſeems to me very reaſonable, and it will be a great encouragement to laborious men, to improve their barren lands, if they ſhould have recompence for what they have done, according as indifferent men ſhould judge, when they leave it, as is the cuſtom in *Flanders*.

CHAP. XIII.

Concerning Woods.

I Have likewiſe obſerv'd ſome Defects in Woods, which I ſhall briefly declare, with the beſt way to remedy the ſame.

1. It's a great fault, that generally thro' the iſland the Woods are deſtroy'd, ſo that we are in many places very much neceſſitated both for fuel, and alſo for timber for building and other uſes; ſo that if we had not coals from *Newcaſtle*, and boards from *Norway*, plough-ſtaves and pipe-ſtaves from *Pruſſia*, we ſhould be brought to great extremity, and many mechanicks wou'd be neceſſitated to leave their callings.

2. That our Woods are not order'd as they ſhould be; tho' Woods are eſpecially preſerved for timber for building and ſhipping, yet at this time it's very rare to ſee a good timber-tree in a Wood.

3. That many of our Woods are very thin, and not repleniſhed with ſuch ſorts of Wood as are convenient for the place.

4. That we fell continually, and never plant or take care for poſterity.

Theſe Deficiencies may be thus remedied:

1. To put in execution the ſtatutes againſt grubbing of Woods, which are ſufficiently ſevere. It's well known, we have good laws; but it's better known, they are not executed. In the *Wild of Kent* and *Suſſex*, which lies far from the rivers and ſea, and formerly were nothing but Woods, liberty is granted for men to grub

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what they pleaſe; for they cannot want firing for themſelves; and they are ſo ſeated, that neither firewood, nor timber can be tranſported elſewhere. I know a Gentleman who offer'd good *Oak* timber at ſix ſhillings and eight pence per tun, and the land in thoſe parts in general is very good. About *Tunbridge* there is land which formerly was Wood, now let for thirty ſhillings per acre; ſo that to keep ſuch lands for Wood would be both loſs to the owner and to the iſland: But in other parts of the iſland it is otherwiſe, and men are much to be blamed for deſtroying both timber and fuel. I have ſeen at *Shooters-hill*, near *London*, ſome Woods ſtubbed up, which were good ground for Wood, but now are nothing but *Furze*; which is a great loſs, both to the owner and to the country; for the land is made worſe than it was formerly. I conceive there are lands, which are as naturally ordain'd for Woods, *viz.* mountainous, craggy, uneven land, as ſmall hills for *Vines* and *Olives*, plain lands for corn, and low moiſt lands for paſture; which lands, if they are ſtubbed, do much prejudice the commonwealth.

2. That all Woods ſhould have ſuch a number of timber-trees per acre, according to the ſtatute. There is a good law for that purpoſe; but men delude both themſelves and the law; they, every felling, cut down the ſtanders which they left the felling before, leſt perchance they ſhould grow to be timber, and leave twelve ſmall ſtanders, that they may ſeem to fulfill in ſome meaſure the ſtatute; but it's a mere fallacy, and deprives the ſtatute of its principal end, which is, to preſerve timber.

3. The beſt remedy againſt thinneſs of Woods, is, to plaſh them and ſpread them abroad,

broad, and cover them partly in the ground, as every country-man can direct: by this means the Wood will ſoon grow rough and thick. It's good huſbandry likewiſe to fill your Woods with ſwift growers, as *Aſhes*, *Sallow*, *Willow*, and *Aſp*, which are alſo good for hop-poles, hoops, *&c.* *Sycamore* is alſo a ſwift grower. In *Flanders* they have a kind of *Salix*, call'd by them *Abel-tree*, which ſpeedily grow to be timber.

4. That ſome law be made, that they which fell ſhould alſo plant, or ſow. In *Biſcay* there is a law, if any cut down a timber-tree he muſt plant three for it; which law is put in execution with ſeverity, otherwiſe they would ſoon be undone; for the country is very mountainous and barren, and depends wholly on iron-mines and ſhipping: their Woods are not copſed there, but only pollards, which they lop when occaſion ſerves. I know one who was bound by his landlord to plant ſo many trees yearly, which accordingly he did, but always in ſuch places that they might not grow. In *France*, near to the borders of *Spain*, they ſow *Aſh-keys*, which when they grow to ſuch a bigneſs that they may be ſlit into four quarters, and big enough to make pikes, then they cut them down; and I have ſeen divers acres together thus planted: hence come the excellent pikes, call'd *Spaniſh*-pikes. Some Gentlemen have ſown *Acorns*, and it's a good way to encreaſe Woods, though the time is long. I doubt not but every one knows, that it's excellent to plant *Willows* along the water ſide, and *Aſhes* nigh their houſes, for firing: for they are good pieces of huſbandry, and it's pity that it's not more put in practice. There is a Gentleman in *Eſſex*, who hath planted ſo many *Willows*, that he may lop two thouſand every year:

year: if others were as ingenious, we ſhould not want firewood; *Oſiers* planted in low mooriſh grounds do advance land from five ſhillings per acre to forty ſhillings, fifty ſhillings, or three pounds, and upwards: it's much uſed weſtward of *London*; and theſe *Oſiers* are of great uſe to baſket-makers. There is a ſort of ſmall *Oſier*, or *Willow*, at *Saint Omers*, in *Flanders*, which grows on iſlands that float up and down; it's far leſs than that which the weſtern men call Eights; with this they make their curious fine baſkets: this plant is worth procuring, being ſo nigh; *John Tredeſcant* hath ſome plants of it. There is a plant likewiſe in *England*, call'd the *Sweet-Willow*; it's not only good for ſhade and firing, but, as I am inform'd, the leaves do not ſour the graſs, but the cattle will eat them ſooner than *Hay*: if this be ſo, it may be of ſingular uſe for meadows.

5. That thoſe things which mightily deſtroy Woods may be reſtrain'd, as iron-works are: therefore the ſtate hath done well to pull down divers iron-works in the foreſt of *Dean*, that the timber might be preſerv'd for ſhipping; which is accounted the tougheſt in *England*, and when it's dry, as hard as iron: the common people uſed to ſay, that in Queen *Elizabeth*'s days the *Spaniards* ſent an Ambaſſador purpoſely to get this Wood deſtroy'd. How true this is I know not; but without queſtion it's admirable Wood for ſhipping; and generally our *Engliſh Oak* is the beſt in the world for ſhipping, becauſe it's of a great grain, and therefore ſtrong; but the *Oaks* of other countries have a finer grain, and more fit for wainſcot: and in this kind our forefathers have been very provident, for we have an act, of long ſtanding, prohibiting iron-works within

within twenty miles of *London*, and within three miles of the river of *Thames:* though you may find iron-ſtone in divers places, as in the great gravel-pit at *Woolhich.* There are ſome ingenious men, who have lately got a patent for making iron with ſea-coal: I hope they will accompliſh their deſires, for it would wonderfully advance this iſland, and ſave Wood. There are two faults in ſea-coal in reſpect of melting iron-oar:

1. That it is apt to bake together, or cake.

2. It hath a ſulphureous fume in it, which is an enemy to metal, and conſumes it, as we ſee by our iron-bars in windows at *London*; ſo that the metalline nature of the iron-ſtone is much waſted by it, and that which remains is very brittle, and will be *could-ſhire.* I know by the mixture of coal beaten with loam, and thoroughly dry'd, one, if not both, of theſe inconveniencies may be taken away. In the duke of *Cleveland*'s country, they uſe half turf and half charcoal. There is a way by making a kind of barter with loam, urine, *&c.* which will cauſe charcoal to laſt very long, as I am informed: but theſe diſcourſes belong to another place.

CHAP.

CHAP. XIV.

Concerning Bees.

1. IT is a great Defect in *England*, That we have no more Bees, conſidering that they are neither chargeable (requiring only a few ſtraws for a houſe) nor troubleſome; and this iſland may maintain ten times as many: for tho' a place may be over-ſtocked with theſe animals, as with the greater, yet I know no part of this land that is ſo; and I know divers places which would maintain many hundred hives, where ſcarce one is to be ſeen.

Our Honey is the beſt in the world, and Wax a ſtaple commodity. That cold country *Muſcovy*, not comparable to ours, has far greater quantity than we have. It's incredible what quantity is found in the woods, if the ſtory of the man be true, who fell up to the ears in honey, and had there periſh'd, had not a bear, on which he caught hold, pulled him out. I have enquir'd, how it comes to paſs that there is ſo great ſtore of honey in *Muſcovy*, conſidering the winters are extream cold, and alſo very long; and I am credibly inform'd, firſt, the ſpring when it begins, comes extraordinary faſt, that the days are very long, and the ſummer far dryer than ours in *England*, ſo that the Bees are not hindered by continual ſhowers, as they are ſome years in this iſle: and laſtly, that the country abounds much with *Firs* and *Pine*-trees, which the inhabitants uſually cut, that the gum, roſinous, or turpentine ſubſtance may ſweat forth, to which places the Bees come, and pre-

ſently fill themſelves, and return laden. And perhaps for theſe very reaſons Bees thrive very much in *New-England.*

2. We are defective in the ordering of them. Not to ſpeak of the negligence of particular men, which is very frequent; nor to write a general ſtory of ordering them, becauſe it requires much paper; and Mr. *Leveret* and *Butler*, eſpecially the latter, hath written ſo exactly, and upon his own experience, that little can be added to it: only in a point or two I differ from him, of which I will ſpeak briefly.

1. That we muſt take and deſtroy all the Bees for their honey, and not drive them, as they do in *Italy*, once or twice a year.

2. That if a ſwarm be poor with little honey, that ſwarm ought to be taken, becauſe it is poor; ſo that the rich ſtocks are deſtroyed, becauſe they are rich, and the poor ſwarms, becauſe they are poor: ſo that be they rich, or be they poor, they muſt be deſtroyed. An *Italian* reports, that in the city of *Askaly* there was a law made, that none ſhould deſtroy a ſwarm of Bees, unleſs he had a juſt cauſe; accounting it a part of extream injuſtice and cruelty, to take away without cauſe, both the goods and lives of ſuch good and faithful ſervants. I am credibly inform'd, that an *Engliſh* Gentleman, beyond ſea, gets many hundred pounds yearly, by keeping Bees, after an ingenious manner; which is thus: he hath a room made very warm and cloſe, with glaſs windows, which he can open at his pleaſure, to let the Bees fly abroad when he pleaſes, where he keeps his Bees and feeds them all winter with a ſweet compoſition made of moloſſes, flowers, ſweet wine, milk, raiſins, *&c.* (for with ſuch things as

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theſe they uſually feed the Bees in *Italy*;) and oftentimes in ſummer, when the weather is rainy, windy, or ſo diſpoſed, that the Bees cannot conveniently go abroad, he feeds them at home with divers ſweet things, and gathers divers flowers and lays them among them; and ſticks up many freſh boughs in divers places of his rooms, that in ſwarming-time they may ſettle on them: by theſe means he preſerves all his ſwarms, and gathers an incredible quantity of honey and wax; and truly this way ſeems to me very probable: for,

1. We know the Bees, (even as we ſay of the Ants) will work continually, even night and day, winter and ſummer, if they were not hinder'd by darkneſs, cold, and moiſture.

2. That Bees do not only make honey, (for I ſuppoſe, that they have a peculiar propriety of making honey, as the Silk-worms ſilk) out of mildews, or honey, but alſo out of all ſweet things, as ſugar, moloſſoes, *&c.*

3. That many ſweet things may be had, far cheaper than honey; which, I ſuppoſe, the Bees will tranſmute into perfect honey. This way, I conceive, would be very advantageous to us in *England*, for the preſerving of late ſwarms, and alſo for the enriching of old ſtocks, ſo that we need not deſtroy them, but might drive them from hive to hive, and ſet them to work again; and truly I think there is no place in the world ſo convenient for this purpoſe as *England*; tho' our Winters are long, yet they are not ſo very cold, but Bees would be ſtirring in them: and our ſummers are ſo ſubject to winds and rain, that many times there is ſcarce a fine day in a whole week: and moloſſoes, refuſe

ſugar, ſweet wort, milk, *&c.* may be had at reaſonable rates.

I hope e're long to give an exact account of this experiment, and deſire thoſe who have any ingenuities of this kind, freely to communicate them. I have not obſerv'd many things more of importance concerning Bees, in my travels; only in *Italy* they make their hives of thin boards, ſquare in two or thee partitions, ſtanding either above one another, or very cloſe, ſide to ſide; by which means they can the better borrow part of their honey when they pleaſe. In *Germany* their hives are made of ſtraw, to which they have a ſummer door, as they call it, which is nigh the top of the hive, that the Bees when they are laden, may the more eaſily enter and diſcharge themſelves of their burthens.

4. We are to blame, that we do not imploy our honey in making metheglin: it's true, that in *Herefordſhire*, and *Wales*, there is ſome quantity of this liquor made; but for want of good cookery it's of little worth, but uſually of a brown colour, of an unpleaſant taſte; and, I ſuppoſe, commonly made of the refuſe honey, wax, dead bees, and ſuch ſtuff as they ordinarily make it of elſewhere: for the good houſewife thinks any thing good enough for this purpoſe, and that 'tis pity to ſpoil good honey by making mead: but I know, if one take pure, neat honey, and ingeniouſly clarify, ſcum, and boil it, a liquor may be made not inferior to the beſt ſack, muſkadine, *&c.* in colour like to rock-water, that ſome curious palates have call'd it *Vin Greco, rich and racy Canary*; not knowing what name to give it for its excellency. This would bring very great profit, not only

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to the publick, by ſaving many thouſand pounds, diſburſed for wines thro' all the world; but would be very advantageous to private families, who uſe to entertain their friends very nobly, wines being at preſent intolerably dear and naught; I hope therefore e're long to ſee it put in execution. An excellent drink, not much unlike this, may be made of ſugar, moloſſoes, raiſins, *&c.* of which I have already ſpoken, yet think it fit to put you in mind of it again.

CHAP. XV.

Concerning Silk-worms.

IT is a great Defect here in *England*, that we do not keep Silk-worms (which in *Italy* are called *Cavalieri*) for to make ſilk. I know that is a great paradox to many, but I hope by this ſhort diſcourſe to make this truth to appear plainly. The original of Silk-worms, by what I read in hiſtories, is from *Perſia*; where infinite numbers are ſtill maintain'd, and the greateſt profits of that great monarch ariſe from thence. *China* alſo abounds very much with ſilk. In *Virginia* alſo the Silk-worms are found wild among the *Mulberry*-woods, and perhaps might be managed with great profit in thoſe plantations, if land were not ſo ſcarce and dear. I ſuppoſe the Silk-worm of *Virginia* is produc'd by the corruption of the *Mulberry*-tree, as *Cochineal* from *Ficus Indica*, or *Indian Fig*-tree: for ſome ingenious and curious men, who have ſtrictly obſerved the generation of inſects, find, that every plant hath an inſect which grows out of its corruption, (as divers ſorts of lice

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from animals;) and that these insects do usually feed on that plant out of which they were made, as lice on the same animals from whence they are engender'd. I know a gentleman † in *London*, who hath three or four hundred insects, and can give a very good account of their original feedings; and also Mr. *Moreney*, in *Paris*, hath a large book of the same subject. But to return to our purpose: I say that we had Silk-worms first from *Persia*. In *Justinian*'s time, about a thousand or eleven hundred years ago, some Monks presented a few to him at *Constantinople*; where, in his time, they began to plant *Mulberries*: from thence it came to *Italy*, about three or four hundred years since: for the ancient writers of Husbandry, as *Cato*, *Pallad*, and *Columell*, do not so much as mention these creatures: and at length these have passed over the mountains into *France* within an hundred years; where they flourish so much, that, if we will believe their own authors, they bring greater profit than the wine and corn of that large country. I know that *France* hath silk enough to maintain their excess of apparel, and to export plushes, velvets, *&c.* If these worms can thrive, not only in the parch'd *Persia*, but also in *Greece*, *Italy*, yea in *France*, which differs not much from the temper of *England*; why should we think, that they are confined to that place, and must move no farther northward? for they have come many hundred miles toward the north, why not one or two hundred more? And we see that *Mulberries*, which is their food, thrive here as well as in any place. But some will object, that our air is too cold and moist. To which I answer:

1. That

† M. *Marshal*.

1. That thoſe who write of Silk-worms, ſay, that you muſt take heed that you make not the place too hot, for too much heat may deſtroy: and therefore that you muſt ſet the windows open to let in the cold air.

2. We know, that moiſtneſs of air rather encreaſes ſuch inſects, and nouriſhes them. Indeed, if moiſture hurts, 'tis becauſe it corrupts their food, and cauſes a flux among them: but this is eaſily prevented, as I ſhall ſhew you anon. But to be ſhort, it's not only my opinion that Silk-worms will thrive here, but the ſolid judgment of King *James* and his Council confirms the ſame; as you may ſee by his letter to the deputy-lieutenants of every county, wherein many weighty reaſons are contain'd to convince men of the ſame; which letter you'll ſee preſently.

Laſtly, we find by experience, that Silk-worms will thrive here, and therefore the matter is out of queſtion: for divers ladies, gentlewomen, ſcholars, citizens, *&c.* have nurſed up worms to perfection, tho' they have had little ſkill in the managing of them; and likewiſe not ſuch accommodations as are neceſſary for them; and more would they have done, if they could have had *Mulberry*-leaves. I am informed that one near *Charing-Croſs* makes a good living by them; as alſo another by *Ratcliff-Croſs*: and therefore if we can bring up an hundred, why not a thouſand, yea, an hundred thouſand, if we had food for them? Truly, I know no reaſon to the contrary, neither could I ever find one, that could ſpeak any thing to the purpoſe againſt the buſineſs. And I muſt tell you, that the ordering of this Worm is very eaſy, none need to be bound prentice to the trade;

trade; the ſpecial buſineſs is to be careful in feeding them, and keeping them ſweet; which things children uſe to do.

Firſt, endeavour to get ſtore of *Mulberry*-trees, which are of two ſorts, the white and the black. The white grows greateſt, and hath a fine leaf, and ſweeteſt, and therefore fitteſt for the young worms. This is eaſily propagated by ſlips, as *Quinces*, *Codlings*, &c. The black *Mulberry* is difficultly propagated by ſlips, but muſt be raiſed from ſeeds, ſown either at *Michaelmas*, when the *Mulberries* are eaten, or kept in dry ſand till the ſpring, and then ſow or hoe them in, as other ſeeds and ſtones, and muſt be diligently weeded. This grows not ſo great a tree as the former: the leaves are rougher and harſher, and fitter for the Worms when they are ſtrong and ready to ſpin. When your trees are grown to a good bigneſs, you may plant them forth, as is uſually done for walks or orchards, or in waſte places, as they do in *Italy*, (for the fruit is little worth, only the leaves are uſeful,) where I have ſeen the trees as bare of leaves at midſummer as at mid-winter. There are two ſorts of Silk-worms, the *Spaniſh* and *Calabrian*. The *Spaniſh* is the ſmaller and more tender, and makes a finer ſilk. The *Calabrian* is greater and more hardy, and makes more ſilk, but coarſer. This ſort ſeems to be the beſt for this country. When the *Mulberry*-trees begin to bud, take the eggs of your Silk-worms, and lay them on a piece of ſtuff, or ſay, (ſome uſe to bathe them firſt in warm *Malmſy*, and ſay that it makes them ſtronger,) and carry them about you in the day in a box, in the night lay them under your bed, or in a warm oven, till the worms begin to come

come forth, then lay a piece of paper of the wideneſs of the box, full of holes, on them, and on the paper lay *Mulberry-leaves*, and as faſt as they hatch they will crawl forth, and ſtick to the *Mulberry-leaves*; which remove into other boxes till all be hatch'd; then when they have paſt their ſecond ſickneſs, feed them on ſhelves, two foot broad and eighteen inches one from another. The room where you keep your worms muſt neither be a low place, nor nigh the tiles; but a middle room, warm and dry, yet ſometimes a little cold air is good.

Take heed of rats and mice, as alſo of hens, robinredbreaſts, ſparrows, and other birds; for they will eat them.

They have four ſickneſſes; the firſt, twelve days after they are hatch'd; and from that time at the end of every eight days: their ſickneſs holds two or three days, and then they are to be fed but very little.

The whole time that the worms feed is about nine weeks: feed them twice a day at leaſt: at firſt, when they are ſmall, give them a few leaves; and as they grow big, more, and feed them oftener. Let your leaves be dry and well air'd upon a table, or cloth, before you give them; and gather not your leaves till the dew be off, and in dry ſeaſons, if you can poſſibly. You may keep your leaves gather'd three or four days, or longer.

Keep your ſhelves and boxes very clean: and take heed you touch not your worms with your hands when you remove them; but don't move them when they are ſick.

In cold moiſt weather ſet a pan of coals in the room, and burn a little *Benjamin*, *Juniper*, &c. eſpecially when they are young, *viz.* the

firſt five weeks; but afterwards, unleſs it be extraordinary cold, give them air, and keep them not too hot, and let the room be well ſcented with herbs.

Let not your Worms be too thick on the ſhelves: if any die, or be ſick, remove them ſoon, leſt they infect the reſt.

As ſoon as by the clear amber-colour of your Worms, you perceive that they would ſpin, make arches betwixt your ſhelves with *Heath* made clean, branches of *Roſemary*, *Lavender*, &c. where the Worms will faſten themſelves, and make their bottoms in two or three days, and about twelve or fourteen days after will come forth; before which time you muſt take away the bottom, which you will uſe for ſilk, and kill the Worm within, by laying the bottoms in the ſun two or three days, or in an hot oven.

The bottom, which you will keep for ſeed, lay in a warm place till the Worms come forth; which put on ſome pieces of old ſay, grogram, or velvet, made faſt to ſome wall: there they will engender, and the male having ſpent himſelf falls down and dies; the female, when ſhe hath laid her eggs: which eggs, when they are gray, you may gently take them off with a knife, and keep them in a piece of ſay in a dry place till hatching-time come.

The winding of the ſilk off the bottom requires a peculiar wheel, which an artificer muſt make: one pound two ounces of the bottom yieldeth from one ounce to three of ſilk.

An ounce of *Spaniſh* ſeed yields ordinarily ſix, eight, or ten pounds of ſilk; and the Worms will eat two hundred and fifty pounds of leaves: the *Calabrian* worms being greater,

eat

eat nigh three hundred weight, and yield eleven or twelve pounds of ſilk.

To conclude: I deſire all men ſeriouſly to conſider, what advantage this buſineſs will bring to this iſland, if it be brought to perfection. Truly I know nothing hinders it but want of *Mulberry*-trees, which will in little ſpace come to a conſiderable bigneſs. And though I commend thoſe who endeavour to advance this work in plantations, and prefer it before *Tobacco*; yet I know that it cannot be done for want of hands; whereas in *England* we have plenty of women, children, old folks, lame, decrepid, *&c.* who are fit to be overſeers of this work. And I wonder gentlemen do not go about a thing ſo pleaſant and profitable, (for three, four, or five at moſt, will attend as many Worms as will make forty or fifty pounds worth of ſilk, in two or three months) and the Worms eat only leaves, which are of no value: neither is there any conſiderable trouble about the Worms, unleſs it be the twelve or fifteen laſt days. I hope, if particular men will not endeavour to advance this work for their private profit, yet the ſtate will for the publick good, it being the beſt way I know to ſet all the poor children, widows, old and lame people to work, and likewiſe will ſave this nation many hundred thouſand pounds *per Annum*. And the way to accompliſh this work may be done without grievance to the ſubject, *(viz.)* to command every one to plant or ſow ſo many *Mulberry*-ſeeds, which may eaſily be procured from beyond ſea, *&c.* But I leave ſtate-matters to ſtates-men, I am none.

A copy of K. James's *Letter to the Lords Lieutenants of the ſeveral Shires of* England, *for the increaſing of* Mulberry-trees, *and the breeding of Silk-worms, in order to make Silk in* England.

JAMES Rex.

Right truſty and well-beloved, we greet you well.

" IT is a principal part of the Chriſtian " care, which appertaineth to gover- " nors, to endeavour by all means poſſible to " encreaſe among their people the knowledge " and practice of all arts and trades, whereby " they may be weaned from idleneſs and the " enormities thereof, which are infinite, and " exerciſed in ſuch induſtries and labours, as " are accompanied with evident hopes, not " only of preſerving people from the ſhame " and grief of penury; but alſo for raiſing and " increaſing them in wealth and abundance, " the ſcope which every free-born ſpirit aims " at, not in regard of himſelf only, but alſo " in regard to the honour of his native coun- " try, whoſe commendations are no way more " ſet forth than in the people's activity and in- " duſtry. The conſideration whereof, having of " late occupied our mind, who always eſteem our " people's good, our neceſſary contemplation, " we have conceived, as well by our own rea- " ſon, as by information from others, that " the making of ſilk, might be as well effect- " ed here, as it is in the kingdom of *France*, " where the ſame hath of late years been put " in practice. For the climate of this iſle is " not ſo different from that country, eſpeci-

" ally

" ally from the hither parts thereof, but it is " to be hoped, that thoſe things which by " induſtry proſper there, may by like induſtry " be propagated here, and have the like ſuc- " ceſs; and many private perſons, who for their " pleaſure have bred thoſe Worms, have found " no experience to the contrary, but that they " may be nouriſh'd and maintain'd here, if " proviſion were made for planting of *Mul-* " *berry*-trees, whoſe leaves are the food of the " Worms. And therefore we have thought " good to let you underſtand, that tho' in ſuf- " fering this invention to take place, we ſhew " our ſelves an adverſary to our own profit, in " regard to our cuſtoms for ſilk brought from " beyond ſea, which will receive ſome diminu- " tion: nevertheleſs, when there is a queſtion " of ſo great and publick utility to come to " our kingdom and ſubjects in general; and " whereby (beſides multitudes of people of both " ſexes and all ages) ſuch as in regard of im- " potency are unfit for other labour, may be " ſet to work, comforted and relieved; we are " content that our private benefit ſhould give " way to the publick. And therefore being per- " ſwaded, that no well affected ſubject will re- " fuſe to put his helping hand to ſuch a work, " as can have no other view in us, but pro- " moting the welfare of our people, we have " thought good in this form only to require " you (as a perſon of the greateſt authority in " the county, and from whom the generality " may receive notice of our pleaſure with more " conveniency than otherwiſe) to take occaſion " either at the Quarter-ſeſſions, or at ſome o- " ther publick place of meeting, to perſwade " and require ſuch as are of ability, (without de-

" ſcending

" ſcending to trouble the poor, for whom we
" ſeek to provide) to buy and diſtribute in
" your county, the number of ten thouſand
" *Mulberry* plants, which ſhall be deliver'd
" unto them at our city of, *&c.* at the rate
" of two farthings the plant; or at ſix ſhillings
" the hundred, containing five ſcore plants.
" And becauſe the buying of the ſaid plants at
" this rate may at firſt ſeem chargeable to our
" ſaid ſubjects, (whom we would be ſorry to bur-
" then) we have order'd that in *March* or *A-*
" *pril* next there ſhall be deliver'd at the ſaid
" place a good quantity of *Mulberry*-ſeeds,
" there to be ſold to ſuch as will buy them;
" by means whereof the ſaid plants will be de-
" liver'd at a ſmaller rate than they can be af-
" forded, being carried from hence: having
" reſolv'd alſo in the mean time that there
" ſhall be publiſh'd in print, plain inſtructions
" and directions both for the increaſing of the
" ſaid *Mulberry*-trees, the breeding of the Silk-
" Worms, and all other things neceſſary to be
" underſtood for the perfecting a work ſo com-
" mendable and profitable, as well to the plan-
" ter, as to thoſe that ſhall uſe the trade.
" Having now made known unto you the mo-
" tives as they ſtand with the publick good,
" wherein every man is intereſted (becauſe we
" know how much the example of our own
" Deputy-Lieutenants and Juſtices will further
" this cauſe, if you and your neighbours will
" be content to take ſome good quantities here-
" of, to diſtribute upon your own lands;) we
" acknowledge that all things tending to plan-
" tation, increaſe of ſcience, and works of
" induſtry, are things ſo naturally pleaſing to
" our own diſpoſition, as we ſhall take it for

" an

" an argument of extraordinary affection to-
" wards our perſon: beſides the judgment we
" ſhall make of the good diſpoſition in thoſe
" that ſhall expreſs in any kind their ready
" minds to further the ſame, and ſhall eſteem
" that in promoting the ſame they ſeek to fur-
" ther our honour and contentment. For having
" ſeen in few years ſpace paſt, that our brother
" the *French* King hath, ſince his coming to
" that crown, both begun and brought to per-
" fection the making of ſilks in his country
" (whereby he hath won to himſelf honour, and
" to his ſubjects a marvellous increaſe of wealth)
" we ſhould account it no little happineſs to us,
" if the ſame work (begun among our people
" with no leſs zeal to their good, than any
" prince can have to the good of his) might
" in our time produce the fruits which there it
" hath done: whereof we nothing doubt, if
" ours will be found as tractable and apt to
" further their own good, now the way is
" ſhew'd them by us, as thoſe of *France* have
" been to conform themſelves to the directions
" of their king.

" Given under our ſignet at our palace of
" *Weſtminſter*, the ſixteenth of *Novem-*
" *ber*, in the ſixth year of *England*,
" *France* and *Ireland*, and of *Scotland*
" the two and fortieth.

CHAP.

CHAP. XVI.

Concerning the Husbandry of other Places.

BEing ignorant of the Husbandry of other Places (*viz.*) what seeds, what fruits, what ploughs, harrows, gardening-tools they have; how they manage and improve their lands; what cattel they have; how they feed and fatten them; and how they improve their commodities, *&c.*

For there is no country where they are such ill Husband-men, but in some particular or other, they excell. As we see even in the several counties of this island, every county hath something or other, wherein they outstrip their neighbours. And that much profit may arise from hence, in this nation, is manifested by that excellent treatise, which is published by you, concerning the Husbandry of *Flanders*, wherein are briefly set down divers particulars very useful for us here in *England*, and formerly unknown. And without question, *France*, *Spain*, *Italy*, *Holland*, *Poland*, *Germany*, &c. have many excellent things, both for Husbandry, Physick, Mechanicks, worth the manifesting, and very beneficial to us: so likewise there are divers things in our plantations, worth the taking notice of in Husbandry. To pass by the southern plantations, as *Barbadoes*, *Antegoa*, *Saint Croix*, *Christopher*, *Mevis*, *Monserrat*, where the commodities are only Cotton-wools, Sugars, Gingers, Indigoes, which our cold climate will not produce; and also Tobacco, which grows also with us, about *Norwich* and elsewhere: we will only sail upon our northern planta-

plantations, *Virginia*, *New-England*, and instance in a few things. Why may not the *Silk-grass* of *Virginia*, the *Salsaparella*, *Sassafras*, *Rattlesnake-weed* (which is an excellent cordial) be beneficial to us, as also their *Cedars*, *Pines*, *Plum*-trees, *Cherries*, great *Strawberries*, and their *Locusts* (which is a prickly plant, a swift grower, and therefore excellent for hedges) be useful to us? So for *New-England*, why should we think that the *Indian-corn*, the *Marsh-wheat*, that excellent *Rye*, the *Pease* (which never are eaten with magots) the *French*, or *Kidney Beans*, the *Pumpions*, *Squashes*, *Water-melons*, *Musk-melons*, *Hurtle-berries*, *Wild-hemp*, *Fir*, &c. of those parts, are altogether useless for us? as also *Cramberries* (which are so call'd by the *Indians*, but by the *English*, *Bearberries*, because it's thought the bears eat them in winter; or *Barberries*, by reason of their fine acid taste like *Barberries)* which is a fruit as big and as red as a *Cherry*, ripe only in the winter, and growing close to the ground in bogs, where nothing else will grow? They are accounted very good against the scurvy, and very pleasant in tarts. I know not a more excellent and healthful fruit.

But some will object, They will not grow here, for your fore-fathers never us'd them. To these I reply; and ask them how they know? Have they try'd? Idleness never wants an excuse; and why might not our fore-fathers, upon the same ground, have held their hands in their pockets, and have said, that *Wheat* and *Barley* would not have grown among us? And why should not they have been discouraged from planting *Cherries*, *Hops*, *Liquorice*, *Potatoes*, *Apricocks*, *Peaches*, *Melicotones*, and from sowing *Rape-*

seeds, *Colliflowers*, great *Clover*, *Canary-seeds*, &c. and many more of this kind? And yet we know, that most of these have been brought to perfection, even in our days; for there is a vicissitude in all things, and as many things are lost which were known to our fore-fathers, (as well the purple colour, *&c.* as you may read in *Pancirol)* so many things are found out by us, altogether unknown to them, and some things will be left for our posterity. For example, not to speak of Gunpowder and Printing, nor of the new world and the wonders there, which notwithstanding are but a few hundred years standing: I say twenty ingenuities have been found even in our days, as Watches, Clocks, Way-wisers, chains for Fleas, divers mathematical instruments, Short-writing, Microscopes, by which even the smallest things may be discerned, as the eggs, eyes, legs and hair of a mite in a cheese. Likewise the Selenoscope, which discovers mountains in the moon, divers stars, and new planets, never seen till our days. But to return to our purpose, I say that in Husbandry it is even so; for the ancients us'd divers plants which we know not, as the *Cytisus*-tree, so much commended for cattle; as also their *Medick*-fodder, which *Columbus* saith endures ten years, and may be mow'd four years, seven times in a year, and one acre he esteems enough for three horses. This fodder likewise is accounted very sweet and healthful, whereas the plants which are usually call'd *Medicæ*'s with us, are annual plants, and have no such rare properties. So we are ignorant what their *Far* or fine Bread-corn was, what their *Lupine*, *Spury*, and an hundred of this kind, as you may read

read in *Mathiolus* or *Dioscorides:* so on the contrary, infinite are the plants which we have, and they knew not, as will appear by their small and our large Herbals; and daily new plants are discover'd, useful for Husbandry, Mechanicks and Physick; and therefore let no man be discourag'd from prosecuting new and laudable ingenuities. And I desire ingenious Gentlemen and Merchants, who travel beyond sea, to take notice of the Husbandry of those parts, *viz.* what grains they sow; at what time and seasons; on what lands; how they plough their lands; how they dung and improve them; what cattle they use, and the commodities thereby; also what books are written of Husbandry, and such like: and I intreat them earnestly not to think these things too low for them, and out of their callings; nay, I desire them to count nothing trivial in this kind, which may be profitable to their country, and advance knowledge. And truly, I should thank any Merchant that could inform me in some trivial and ordinary things done beyond sea, *viz.* how they make *Caviare* out of sturgeon's rows; in *Muscovy*, how they boil and pickle their sturgeon, (which we *English* in *New-England* cannot as yet do handsomely;) how the *Bologna*-sausages are made; how they ferment their bread without yest; of what materials divers sorts of baskets, brooms, frails are made; what seed grout or grutze is made of; and also how to make the *Parmisan*-cheese of *Italy*, which is usually sold here for two shillings, or two shillings and six-pence *per* pound; or the *Angelots* of *France*, which are accounted better cheeses than any made in *England*; as also the *Holland*-cheeses, which are far better than our ordinary

cheeses, and yet these sorts of cheeses are not made of mare's milk, as some think, but from the cows, and our pastures are not inferior to theirs, *&c.*

2. I desire ingenious men to send home whatsoever they have rare of all sorts; as first, Animals, the fine-wool'd sheep of *Spain*, *Barbary* horses, *Spanish* jennets, *&c.* and so likewise all sorts of Vegetables not growing with us, as *Pannick*, *Millet*, *Rice*, which grows in the fenny places of *Millan*; and why may it not grow in our fens? and the best sorts of grains or fruits in use amongst us. Perhaps there is *Wheat* that is not subject to smut or mildew; perhaps other seeds will give double increase, as *Flax*, *Oats*, *Pease*; and divers other things of importance there are beyond sea, which may be useful to us; as the *Askeys*, the *Cork*, *Acorns*, the *Scarlet-oak*, *Sweet-annise*, which grows abundantly in *Millan*, *Fenel*, &c. *Tilia* or *Linder*-tree for basse ropes, *&c.* *Spruce-pines* for masts and boards, seeing that they are swift growers, and many will stand in a small piece of ground: they have formerly grown here, and some do flourish in our gardens, and in *Scotland.* I think this ought seriously to be considered: for although we have plenty of *Oaks*, yet what will it profit for shipping without masts? And how difficult it is to get great masts above 22 inches diameter, is very well known. Many things I might add of this kind, but for brevity's sake I refer you to Mr. *John Tradescant*, who hath taken great pains herein, and raiseth daily new and curious things.

3. Consider that these ingenuities may be profitable, not only to the publick, but also to private men; as we see by those who first planted

ed *Cherries*, *Hops*, *Liquorice*, *Saffron*, and first sowed *Rapeseed*, *Colliflowers*, *Woad*, *Would*, early *Pease*, *Asparagus*, *Melons*, *Tulips*, *Gilliflowers*, &c. and why may we not find some things beneficial to us also?

CHAP. XVII.

Of our ignorance of the Metals, Minerals, &c. produced in England.

THO' it may seem to many that these things little concern the Husbandman, who usually is not a Naturalist, but only endeavours to know his own grounds and the seeds proper for it, and seldom pierceth into the bowels of the earth: yet if we consider that out of the earth he hath Marl, Lime-Stone, and Chalk, for the inriching his lands; and also Loam and Sand for buildings; oftentimes Fuel for fire, *&c.* it will plainly appear, that it is necessary for him to know all subterraneous things, and to be a petty natural philosopher, and that the knowledge of these things will be very beneficial to him. And here I cannot but take notice of a great defect among us, *viz.* that we have not the natural history of all the Sands, Earth, Stones, Mines, Minerals, Metals, *&c.* which are found in this island: it would not only advance Husbandry, but also many other mechanick arts, and bring great profit to the publick. I hope some ingenious man will at length undertake this task; for the Lord hath blessed this island with as great variety as any place that is known, as shall in part appear anon; and it may be proved by that great variety which is found near the *Spaw*-waters in *Knaresborough*,

borough, as Dr. *Dean* relates in his book call'd the *Engliſh Spaw: Or the glory of* Knareſborough, *ſpringing from ſeveral famous fountains there adjacent (called the vitrol, ſulphurous, and dropping Wells) and alſo other Mineral-waters*; whoſe words are theſe: "Here is found not only white "and yellow Marl, Plaiſter, Oker, Rudd, "Rubrick, Freeſtone, an hard Greet-ſtone, a "ſoft Reddiſh-ſtone, Iron-ſtone, Brimſtone, "Vitriol, Niter, Allum, Lead and Copper: "(and without doubt divers mixtures of theſe) "but alſo many other Minerals might perhaps "be found out by the diligent ſearch and in-"duſtry of thoſe who would take pains to la-"bour a little herein."

This letter will not permit me to make a compleat Natural Hiſtory of the things of this iſle; yet I ſhall relate divers things, which may be as hints to ſet ſome others to work, which I have found in Mr. *Cambden* and others; and ſhall briefly inſtruct the Huſbandman what he ought to take notice of for his own and other's good. And firſt, if he live nigh the ſea, let him take notice of thoſe things the ſea caſts, for it hath with us caſt up Ambergreaſe, which is worth ſo much gold; with which not long ſince a fiſherman of *Plymouth* greaſed his boots, not knowing what it was: ſometimes it caſteth up Jet and Amber, as at *Whitby* oftentimes. In former times we had Oyſters which had very fair great pearls in them, of good worth; and at this time ſome of them are found in *Denbighſhire*; Coperas-ſtone likewiſe is found along the ſea coaſts of *Kent*, *Eſſex*, *Suſſex*, *Hampſhire*, out of which Coperas is made; a thing very uſeful for dyers, curriers, *&c.* Alſo Sea-weeds are not to be ſlighted; for in *Jerſey* they have no

other

other fuel among them; and in *England* it is burnt to make Kelp for glaſſmen, and is alſo very good manure for divers lands; alſo *Sea-owſe* is not only good to lay on land, but at *Dover*, and other places, the inhabitants make brick thereof, call'd *Flanders*-bricks, *&c.* Sea-ſands in *Cornwall* very much enrich their lands; and in *Cumberland* out of a certain kind of Sand they extract Salt, *&c.*

2. Let him take notice of all ſorts of Waters, which iſſue forth of the earth, differing from the ordinary, in colour, odour, taſte: for it it is well known how advantagious theſe Waters are oftentimes, not only to particular men, but alſo to the country about, and to the whole iſland; as appears by the Waters of *Tunbridge* in *Kent*, and of *Epſom* in *Surry*, *Scarborough-ſpaw* in *Yorkſhire*, and by the Allum-waters at *Newenham* in *Warwickſhire*, like milk in taſte and colour, and are excellent for the ſtone and wounds; and alſo it appears by the Salt-fountains in *Worceſterſhire* and *Cheſhire*, which furniſh all thoſe parts with an excellent fine white Salt: by the hot *Baths* in *Somerſetſhire*, and the luke-warm Waters by *Briſtol*, &c. At *Pitchford* in *Shropſhire* is a fountain which caſteth forth liquid Bitumen, which the people uſe for pitch, *&c.*

3. Let him not deſpiſe the ſorts of Sands which he finds; for ſome Sands are for buildings, as the rough ſorts; others for ſcowering, others for caſting fine metals, as *Highgate*-ſand; others for the glaſſmen, as a Sand lately found in *Suſſex*. In *Scotland* there is a Sand, which contains a conſiderable quantity of gold: and in divers countries fine gold aboundeth very much in Sand;

Sand; and if we may believe an excellent *Dutch* chymiſt, there is ſcarce any Sand without it.

4. Let him take notice of the Earth, Loams, Clays, *&c.* which have divers and neceſſary uſes: as firſt, the ſtiffeſt Clays, as *Newcaſtle* and *Nonſuch*, are for the glaſſmen's pots, for crucibles, melting-pots; the leſs ſtiff for ordinary earthen ware, brewers, tiles, bricks, *&c.* white Clay is for tobacco-pipes. Marl of divers colours and ſtiffneſs is excellent for Huſband-men. Fullers-earth is found in *Kent*, *Surry*, and lately in divers other places, for the great benefit of the clothier. Rub and Rubrick in *Yorkſhire*, as alſo divers other in *Oxford* and *Gloceſterſhires*, excellent for painters, &c. Turf for firing may be found in moſt parts of this iſle, if people were induſtrious: neceſſity now and then compells them to be inquiſitive, as it did lately in *Oxfordſhire* and *Kent*, where it is found in good quantity. In *Holland* they have little fuel, ſave what is taken out of their ditches; and therefore it is truly ſaid, that their firing is as it were fiſh'd out of the water, and it's indifferent good fuel. Coals are found in very many places, yet divers places are in great want of them.

5. Let him take notice of the ſeveral ſtones found in this iſle, as of Freeſtones for building; Cobbels and rough hard ſtones for paving; Tomb-ſtones; ſoft ſandy ſtones, commonly called Fire-ſtones, becauſe that they will endure ſtrong fires, and therefore fit for iron furnaces; and this property theſe ſoft ſtones have, that when they are white hot, a ſteel inſtrument will ſcarce touch them to hurt them. Alabaſter is found at *Burton upon Trent*, and in *Staffordſhire*, and at *Titbury*-caſtle: excellent Marble at *Snothil* in *Herefordſhire*: a coarſe Marble near *Oxford*;

and

and in *Kent*, alſo at *Purbeck* in *Dorſetſhire*; Mill-ſtones in *Angleſey*; in *Flintſhire* and *Derbyſhire* Lime-ſtones: Chalk in very many places, for divers uſes: Allum-ſtone is found in *Angleſey*; but eſpecially at *Giſborow* in *Yorkſhire*, where the Allum-works are which ſerve this iſland: *Lapis Calaminaris* is lately found in *Somerſetſhire*, by which copper is made braſs: Manganeſe, for thoſe that make white-glaſs, is lately found in the north: the beſt Emery for poliſhing iron, in *Jerſey*: Plaiſter at *Knareſborough*; Black-lead in *Cumberland*, and no where elſe in *Europe*. There is a ſtone in *Durham* out of which they make ſalt. Diamonds are found about *Briſtol* and *Cornwall*, very large but ſoft. There is a ſtone near *Beaver-caſtle* like a ſtar: In *Yorkſhire* another, like a ſerpent petrified: and alſo other ſtones round like bullets, which being broken have as it were a ſerpent in them without an head, &c.

6. Of all Minerals and Metals. Iron-ſtone is found almoſt in every county, and is profitable where wood is plentiful; the beſt is found in *Lancaſhire*, one load and a half making a ton of iron; it has been tranſported into *Ireland*, to mix with poor *Mini*. In *Richard* the Second's time a Copper-mine was found at *Wenlock* in *Shropſhire*, but exhauſted: in Queen *Elizabeth*'s days one was found at *Keſwick* in *Cumberland*; and lately in *Staffordſhire*, *Yorkſhire*, and near *Barnſtable* in *Devonſhire*, on which ſome Gentlemen intend ſpeedily to work. Lead is found in *Durham-wall* and *Devonſhire*: Brimſtone in *Yorkſhire* and *Wales*: Antimony in *Staffordſhire*: a Silver-mine in *Cardiganſhire*: a Gold-mine was diſcover'd in *Scotland* in king *James*'s time; and many rich mines might be

diſcover'd in *England*, if the king's prerogative (which is, to take all royal mines to himſelf, *viz.* Silver, Gold and Copper) were ſo certainly aboliſhed, that they which ſhould find theſe Metals in their own lands, might ſafely dig them. But ſome will object and ſay, that many things are of little worth and profit. To theſe I anſwer, that God hath made nothing in vain, every thing hath his peculiar uſe, and though ſome things ſeem to be of little worth and contemptible, as Sand, Loam, Chalk; yet it hath pleaſed the wiſe Creator to make theſe things very neceſſary for man's comfortable ſubſiſtence, which they that want theſe things can teſtify: As for example, in *New-England*, where there is no Chalk nor Lime-ſtone, they are compelled to burn oyſter-ſhells, cockles, to make Lime; or elſe they could hardly build any houſes. The like I may ſay of Sand and Loam in divers places, where they are wanting.

2. I ſay that moſt of thoſe things I have ſpoken of are very profitable in one place or other. To inſtance in ſome of the meaner ſort; at *London* brick-men give fifty pounds *per* acre, only for Loam to make bricks, and pay three pounds *per* acre of yearly rent, and are to leave the land worth the ſame yearly rent: likewiſe I know a Chalk-cliff in *Kent*, not two acres of ground, valued at many hundred pounds; and that one column of Chalk, which is ten foot ſquare, is valued at forty or fifty pounds, at eight pence *per* load. The Oker-mines of *Oxfordſhire* and *Glouceſterſhire* are of great value, and ſo would others of that kind, if they could be found; ſo is the Blacklead-mine. Alſo the pits of Clay, Marl, Coal, Turf, *&c.* And therefore I deſire all country-men to endeavour

to

to know all ſorts of Stones, Clays, Earths, Oars, *&c.* and to teach their children the uſe of them, that they may know that this Sand is for building, this Loam for bricks, this Clay for pots, this Marl for corn-land: and if that they ſhould find any Stones, Earths, which they know not, that they would lay them up till they meet with ſome ingenious man that can inform them. The richeſt Mines of the world have been found out by this means, if we will believe hiſtories. And this I am ſure of, that by this means they may much advance their knowledge, and be more profitable to the publick, their neighbours, and alſo to themſelves.

CHAP. XVIII.

Of our ignorance of the virtues and uſes of the Vegetables of England.

THE firſt Defect that I take notice of, is the ignorance of the ordinary ſeeds which are commonly ſown amongſt us: for uſually the country-man contenteth himſelf with one or two ſorts, and knows no more, when as there are very great variety; ſome of which agree with one ſort of ground, ſome with another; as for example, there are very many ſorts of *Wheat*, ſome called White *Wheat*, ſome Red *Wheat*, ſome Bearded, (which, as I have ſaid before, is not ſo ſubject to mildews, as others) others not: ſome ſorts with two rows, others with four and ſix, and ſome with one ear on a ſtalk, others with double ears, or two on the ſame ſtalk; Red-ſtalk *Wheat* of *Buckinghamſhire*, Winter *Wheat*, Summer *Wheat*, which is ſown abundantly in *New-England* in *April* and *May*, and reap'd ordinarily

rily in three months; and many ſorts more; not to trouble my diſcourſe with *Spelt*, *Zea*, *Tiphine Wheat*, or *Olew*, *Far*, *Siligo*, *Alica*, which were uſed among the antients, but now unknown not only to the country-man, but even to the moſt learned botaniſts. So I may ſay that the ordinary yeoman is ignorant of the different ſorts of *Barley*; for there is not only the ordinary *Barley*, but alſo Big ſprat *Barley*, which hath lately been ſown in *Kent* with good profit; alſo Winter *Barley*, ſown in winter; *Barley* with four or ſix rows, Naked *Barley*, which require divers diſpoſitions in land; ſome delighting in finer, others in ſtiffer grounds. So there is alſo Winter and Summer *Rice*, and twenty ſorts of *Peaſe*; the Schew, the Raith or Early-ripe *Peaſe*, the Roncival, Haſtivers, Hotarſes, Gray *Peaſe*, Green *Peaſe*, *Peaſe* without ſkins, Sugar *Peaſe*, whoſe ſhells are ſweeter than the *Peaſe* itſelf, and have been within theſe ten years plentifully ſown in *Lincolnſhire* with profit; alſo *Fulham*, *Sandwich Peaſe*, &c. which require divers ſorts of lands and ſeaſons. So alſo there are divers ſorts of *Oats*, white, black, naked, which in *New-England* ſerve well for oatmeal without grinding, being beaten as they come out of the barn; *Scotch*, *Poland*, &c. alſo Buck *Wheat*; divers ſorts of *Tares*, of *Hemp* and *Flax*, altogether unknown to moſt country-men, but I hope hereafter they will be more inquiſitive after them: for divers of them may be of good uſe on their lands.

2. That they are ignorant of the *Plants* and *Graſſes* which naturally grow among us, and their uſes, which likewiſe were made for to be food for cattle, and alſo for the ſervice of man. This ignorance cauſeth them to admire, and to eſteem

eſteem even as miraculous, ordinary and trivial things; as for example, how it cometh to paſs, that in one meadow an horſe thrives very much and ſpeedily, and yet a bullock will not in that place; and in another meadow, cloſe by the former, the bullock will thrive, and the horſe not: ſo alſo how it comes to paſs, that conies and ſheep will thrive well where there is ſcarcely any paſture, and yet come to nothing on commons, where there is a greater quantity of paſture; which proceeds from this cauſe, that ſome kind of plants are more agreeing and ſweeter to one ſort of cattle than to another, and every beaſt almoſt hath ſome plant or other, which they love exceedingly. I ſuppoſe, that obſervations of this kind might be very uſeful in Huſbandry. Theſe Deficiences I will draw to three heads.

1. I ſay that divers plants (not to ſpeak of fruits, becauſe we have already ſpoken of them) that grow naturally in our iſland, may be very ſerviceable to the Huſbandman, both for his paſture and corn-lands. To inſtance in ſome few: we ſee that divers ſorts of *Vetches*, *Chiches*, *Tares*, &c. grow wild in divers places, which though they bear not ſo great and large crops, as ſome others already uſed; yet who knows what they would do if they were manured as other grains, and land proper for them? for we ſee that the tranſplanting of plants into gardens doth very much meliorate or better them; and without doubt all thoſe grains which are in uſe with us, were at firſt picked out of the fields and woods, and by ingenious men found uſeful for man or beaſt; and of late divers have been found not known to our forefathers, as *Saint Foin*, *Lucern*; and why may not

not we find divers *Graſſes*, *Vetches*, *Medicæ's*, wild *Peaſe*, &c. which as yet are ſcarce taken notice of?

2. There grow divers ſorts of wild *Peaſe*, but to ſpeak of two only.

Firſt ſort, which grows on the ſtony beaches of the ſea, where there is little or no earth, the roots are many foot deep in the ground. In Q. *Mary*'s days, in a dearth, the poor people gather'd divers ſacks full of them, and they were no ſmall relief to them: who hath tried whether they would thrive better on better land?

Second ſort grows on dry barren land, and is commonly call'd the Everlaſting *Pea*, which continually grows out of the ſame root. In gardens I have ſeen it grow ten years together, and larger at the end of ten years than the firſt. I have alſo ſeen it flouriſh on barren grounds, where *Oats* were burn'd away: who knows but theſe and other plants may be ſerviceable, if not for man, at leaſt for beaſts or pigeons? for in *New-England* the great flights of pigeons are much maintain'd by theſe. I am ſure it were good to make experiments of theſe and divers others.

2. Head, is the ignorance of the mechanical uſes of Herbs and Trees, for even for theſe uſes moſt plants have ſome peculiar property. To inſtance in a few: We know that *Elm* is for wheels, and the beſt wood to make herrings red; *Oak* is for the ſhip-wright, joyner, tanner: *Horn-beams*, *Beech*, for the mill-wright; *Line*-tree for baſs-ropes; old *Elder* without pith is very tough and fit for cogs of wheels, tooth-pickers; *Pear*-tree for Mathematical inſtruments and Engravers, &c. *Oſiers* for baſkets; *Walnut* for gun-ſtocks; *Aſp* for hoops; *Box*, *Aſh*,

Aſh, for a hundred uſes; and much more might be ſpoken of this kind, if time would permit. So likewiſe divers plants are for painters, as you may ſee in *Battee*'s experiments: ſome for the dyers; but as yet we know but four (*viz. Woad*, *Would*, *Green-wood*, and *Madder*) among twelve hundred plants and upward, which grow wild with us. I could wiſh ſome ingenious man would take the pains to ſearch out the mechanical uſes of plants; ſurely it were a good way to advance mechanicks, who in their callings uſually go round, as horſes in a mill, and endeavour very little to advance or know the cauſes of their operations. I know a gentleman who promiſes ſome things in this kind, and I hope will be as good as his word.

3d Head, is the ignorance of the very phyſical uſes of plants: for tho' many hundred plants grow among us, yet but few of them are uſed phyſically, whereas there is ſcarce any one but may be uſeful in this kind. And truly in my opinion it is a great fault that we ſo much admire thoſe things that are far fetch'd and dear bought; when as oft-times they are gather'd in unſeaſonable times, and corrupted by long voyages by ſea, counterfeited by merchants; yea, we have very oft *quid pro quo*, and rank poyſons, and do neglect thoſe medicines which God hath given us here at home. I am credibly inform'd, that in former times, *Virga aurea* was in great uſe with us, and uſually ſold for eight pence *per* ounce, and brought from *France*; but ſo ſoon as it was found growing plentifully in our hedges, it was caſt forth of the apothecaries ſhops, as of little virtue. And tho' ſome will object, that our plants have little virtue, I ſay it's falſe; for God hath tem-

pered

pered them for our complexions: and we ſee very often that one ſimple medicine doth more good than the great compoſitions of the antients, which are rather *ad pompam* than for health, and ſeem to ſavour ſomewhat of the mountebank; becauſe *Opium* is always an ingredient. And farther we ſee, that where any endemical or national diſeaſe reigns, there God hath alſo planted a ſpecific for it; as the *Cochlear* or *Scurvy-graſs* for the ſcurvy: in the *Baltick-ſea*, where it is very frequent, and alſo in *Holland*, *England*. So in the *Weſt-Indies* (from whence the great pox firſt came, and where it reigns very much, that not only man but other creatures are ſo infected with it, that even dogs die of that diſeaſe in our northern plantations, perhaps catching this infection by mingling with *Indian* dogs) there grow the ſpecifics for this diſeaſe, as *Gujacum*, *Salſaperilla*, *Saſſafras*, and the ſavages eaſily cure theſe diſtempers. Farther we ſee, that even the irrational creatures can find not only meat, but alſo medicines for themſelves; as the dog, *Couchgraſs* for a vomit; the dove, *Vervein*; the weaſel, *Kue*; the ſwallow, *Celandine*; the toad, *Plantane*: and where is our reaſon that we cannot?

I therefore deſire all country people, to endeavour to know theſe plants which grow at their doors; (for God hath not planted them there for no purpoſe, for he doth nothing in vain) and to collect together the plain ſimple medicaments of their grandames; by this means they may ſave many a forty pence: I mean preſerve themſelves and families, and neighbours, in good health. Some ſmall treatiſes have of late been written, to ſhew the uſe of our plants in phyſick; and I hope ingenious men will

daily

daily more and more communicate the ſecrets of this kind, which they have in their hands, for the publick good.

CHAP. XIX.

Concerning Animals, Fiſh, Inſects.

THEY that write of four-footed beaſts reckon about one hundred and twenty ſpecies of them: half of them are ſcarce known among us. I ſuppoſe therefore that divers ſpecies are wanting, which may be uſeful. To inſtance in ſome: And

1. To begin with the Elephant; the greateſt, wiſeſt, and longeſt liv'd of all beaſts: which abound very much in the eaſtern parts of the world, as *China*, *India*, and are accounted very ſerviceable both for the wars and for carriage, (fifteen men uſually riding on his back together.) They are not chargeable to keep: why may they not be of uſe even here, when I am credibly inform'd an Elephant liv'd divers years here in a park? So that they can endure the coldneſs of this climate.

2. The Buffalo, which is as big as an ox, and ſerviceable both for the plough and for their milk. Their ſkins make the beſt buff; they will fare very hard, and live in fens and bogs, where nothing elſe can. In the dominions of the Duke of *Florence*, near *Piſa*, are many of them.

3. The honeſt and patient Aſs, which was very much uſed in old time for carriage, (as the horſe for war, and the ox for the plough) and in many countries at this time. They will eat

Thiſtles, and live almoſt with nothing. They may ſave men (who are not able to keep an horſe, becauſe he is a great feeder) much labour.

4. Mules, which is a very ſtrong and proud beaſt, and will carry far more than an horſe, and are more ſure-footed. I ſuppoſe, that they might be ſerviceable to the carriers here, as they are beyond ſea.

5. Black Foxes, may be profitable; whoſe ſkins have been ſold from twenty pounds *per* ſkin to ninety pounds. I might add divers more of this kind; as Muſk-cats, Sables, Martines, Minks, Muſk-ſquaſh, Guiney-pigs, and a ſort of Cony, which ſome few have in *Hampſhire*, whoſe fur is worth half a crown or three ſhillings *per* ſkin, being little inferior to Beaver, *&c.* but for brevity's ſake I paſs them over: as alſo divers ſorts of Fowls, of good uſe; as a kind of Duck with a crooked bill, which lays conſtantly as Hens do; as alſo Hawks of divers ſorts, of good value, which perhaps the countryman loves not, becauſe they are enemies to his poultry.

Second Defect is, that we do not endeavour to advance the beſt kinds of the cattle which are among us. And

1. To begin with horſes. The *French*-man that wrote a book, call'd *the Treaſure politick*, ſays, that in *England* in Queen *Elizabeth*'s days, we had not above three or four thouſand horſes worth any thing for war, and thoſe only in noblemen's ſtables, which perhaps encouraged the *Spaniards* to invade us; but at this time we are known to have many thouſand horſes not inferior to the beſt in the world: yet I ſuppoſe, we might much meliorate our breed

by

by *Spaniſh* Jennets, *Barbary*, &c. And we are not ſo careful to increaſe good horſes as we ſhould be.

2. We are too negligent in our Kine, by not advancing the beſt ſpecies: for ſome ſorts give abundance of milk, and better than others: ſome ſorts are larger, more hardy, and will ſooner fat, *&c.* *Lancaſhire*, and ſome few northern counties, are the only places where they are a little careful in theſe particulars.

3. We are not curious in procuring the beſt ſort of Sheep, for bigneſs, ſoundneſs, and fine wool. I wonder that ſome of our ſheep-maſters have not procur'd of thoſe exceeding fine-wooled Sheep of *Spain*, whoſe wool coſts the merchant nigh ten ſhillings *per* pound before it is exported: I ſuppoſe that it would for a time mend our wool, if not continue ſo for ever; for theſe ſheep were firſt carried out of *England*, if we may believe ſtories, *Spain* not affording ſuch Sheep before. *Dutch* Sheep are reported to have two or three Lambs ordinarily. *Dutch* Sheep are very large, with great tails; but their wool is very coarſe, not only becauſe of their coarſe feeding, but alſo becauſe in hot countries they ordinarily mingle with goats, and therefore in *Venice* ordinary porters will ſcarce eat any mutton. And here I cannot but relate, that all ſtrangers very much wonder at two things in our Sheep, (not to ſpeak of the fineneſs of wool:) And

1. That our Sheep, if they be ſound, ſeldom or never drink, even in ſummer, tho' they go on the drieſt chalky-lands; as it plainly appears in *Kent*, where there is ſcarce water for the great cattle: which proceeds from the moiſture of our air, and abundance of rains and dews.

2. That our Sheep do not follow their ſhepherds as they do in all other countries: for the ſhepherd goes before, and the Sheep follow like to a pack of dogs. This diſobedience of our Sheep does not happen to us, as Popiſh prieſts tell their ſimple flocks, becauſe we have left their great ſhepherd the Pope; but becauſe we let our Sheep range night and day in our fields without a ſhepherd, which other countries dare not for fear of wolves and other ravenous beaſts, but are compell'd to guard them all day with great dogs, and to bring them home at night, or to watch them in their folds.

Third Defect in this kind, is the neglect of Fiſh-ponds, which are very profitable: for Fiſh uſually live by ſuch worms and flies as are ingender'd in the ponds, and require no charge. Concerning the ordering of them, and the profit of them, read Mr. *Vaughan*'s *Golden Grove*. And ſurely it would be a great benefit to this iſland if we had Fiſh at reaſonable rates. I cannot therefore paſs by two extream abuſes, which exceedingly deſtroy Fiſh, and are in no wiſe to be permitted.

1. That divers poor men keep many ſwine, and in nets, or otherwiſe, catch many veſſels of the young fry of Fiſh, and feed their ſwine with them.

2. That the fiſhermen in the river have the meaſhes of their nets ſo ſtreight, that they take many ſorts of Fiſh when they are too ſmall, and do deſtroy more Fiſh than they take. I hope theſe abuſes will be reform'd with all ſeverity. To this head I may add Decoys, which are very frequent in *Holland*, and profitable; but very rare with us in *England*: yet might be very profitable and delightful.

Fourth

Fourth Defect, is our ignorance of the Inſects of this iſland. And tho' it may ſeem ridiculous to many, to affirm that Magots, Butterflies, ſhould be of any importance; yet I deſire them to conſider, that we have our honey, the ſweeteſt of food, from Bees; which are cattle of this kind: alſo all our ſilks, ſattins, pluſhes, and bravery from the poor Silk-worm, which may be call'd a Magot, Caterpillar, or Butter-fly, *&c.* the richeſt of our colours from the Cocheneal, which is one of this ſort. Gum-lac is made by Ants; ſome are uſed for food, as Locuſts, *&c.* as you may read in *Muſſet*'s book *de Inſectis*. Many of theſe likewiſe are uſed in phyſick, as Cantharides, Wood-ſows, Lice, *&c.* Some think, that medicines, tranſcending even the chymiſts, may be had out of theſe; for every plant, which hath a medicinal virtue, is alſo ſublim'd up into this living quinteſſence: and therefore I commend divers ingenious men, as Mr. *Marſhal*, and others, who have collected many hundred ſorts of theſe; and I hope they will communicate e'er long their experiments to the world.

CHAP.

CHAP. XX.

Concerning divers things neceſſary for the good of Cattle.

I. THAT we are ignorant of the divers diſeaſes of cattle and their cures. To run over all the diſeaſes of cattle and their cures would be too long: you may read them in Mr. *Markam*'s works, *the Country Farmer*, and others. I will inſtance only two; which, ſome years, ſweep away cattle as the plague doth men, *viz.* the Murrain amongſt great cattle, and the Rot among ſheep. And tho' divers have wrote concerning the cures of theſe diſeaſes; yet we do not find that effect which we deſire, and therefore I hope ſome will attempt to ſupply this defect, and write a good treatiſe about the diſeaſes of cattle. Of theſe two diſeaſes I ſhall briefly declare my mind. And

1. Of the Murrain, which proceeds from an inflammation of the blood, and cauſes a ſwelling in the throat, which in little time ſuffocateth the cattle. The eſpecial cauſes of this diſeaſe are an hot and dry ſeaſon of the year; which dries up the waters, or at leaſt does ſo putrify them that they are unwholſome; and alſo the letting of carrion lie unburied. This diſeaſe is thought to be infectious; but perhaps it may proceed from one common cauſe, as the rottenneſs of ſheep. The beſt way to keep your cattle from this diſeaſe, is to let them ſtand in cool places in ſummer, and have abundance of good water, and ſpeedily to bury all carrion: and if any of your cattle be infected, immediately let them blood,

blood, and give them a good drench, *&c.* By theſe means divers have preſerved their cattle, when their neighbour's have periſh'd.

2. Concerning the Rot of ſheep, not to ſpeak of the Pelt-rot, or ſheep that are ſtarved; but of the ordinary Rot, called by ſome the White-Rot, and is a kind of dropſy, their bellies are full of water, and their liver diſcolour'd. I have ſeen out of the livers of ſheep tending to Rottenneſs, living creatures, leaping like ſmall flounders; which without doubt in a little time will deſtroy the liver, and conſequently produce an indiſpoſition not unlike to the Rot. The common people ſay, that theſe worms are cauſed by the over-heatings of ſheep, and that Rottenneſs proceeds from a plant call'd *Coiyledon*, or *Marſh-penny-wort*, which is of a very ſharp taſte, and therefore not likely that ſheep will eat it; but it may be a ſign of wet rotten land, as *Broom* is of ſound and dry land. This is certain, that in wet moiſt years ſheep die very much of the Rot, and in dry years on the ſame ground they hold ſound; and yet I have heard that in *Ireland*, which is far moiſter than *England*, Rottenneſs of ſheep is not known. It were therefore well worth the labour of an ingenious man to enquire into the cauſes of theſe indiſpoſitions in ſheep.

The means which have been found very effectual for the curing of theſe diſeaſes, are theſe; firſt, to drive your ſheep up to dry lands, or to keep them in the fold till the dew be off the graſs, or to feed them ſome days with fine dry hay, eſpecially of ſalt meadow, or to put them into ſalt marſhes; for in thoſe places ſheep never rot; or to drive them to ſome ſalt river, and there to waſh them and make them drink

of

of the water; this will kill the ſcab, and alſo the ticks, and faſten the wool. But if you have not the conveniencies before mention'd, then rub their teeth with ſalt; or rather make a ſtrong pickle with ſalt and water, and force them to drink thereof. Some dry pitch in an oven, and add to the pickle, and have found good ſucceſs. For theſe medicines exſiccate the ſuperfluous humidities, open obſtructions, and kill worms. Some commend the antimonial cup, as a cardinal medicine againſt all diſeaſes of cattle.

Of Feeding.

II. We are ignorant of divers ingenuities concerning feeding and fatting of cattle and other creatures. To inſtance in ſome: And

1. Of the horſe, who is a great feeder. In *Kent* and *Hertfordſhire* they uſually cut all their *Oats* and *Peaſe* ſmall, and give them with their chaff; by this means the horſes ſooner fill themſelves, and eat all the ſtraw up. Some put horſe-meat into a bag, and ſo order it that a little only lies in the manger, which when that is eaten up more falls down, and not before; by this way horſes do not blow their meat, nor throw it out of the manger with their noſes. A farther good piece of huſbandry they uſe, which is this; when their horſes are well fed at night, they fill the rack with *Wheat* or *Barley*-ſtraw, and ſo leave them; the horſe perceiving that that which is in the rack is not very pleaſant, lies down and takes his reſt, which is as good to him as his meat: if he riſes in the night, and falls to the rack and manger, as he uſually does, and finds nothing

nothing but ſtraw, he ſleeps till the morning; but if it be *Hay*, *Tares*, or *Peaſe*, the jade will pull all down and ſpoil it, and likewiſe will be hinder'd from his reſt; by which double damage inſues. Currying and dreſſing of horſes ought not to be forgot; it is half as good as their meat. Brimſtone and Elecampain roots are the eſpecial ingredients for his phyſick.

2. Of the feeding and fatting of cows. We uſually feed cattle with ſtraw in racks in the yard, or turn them to the fields, and there let them feed as much and how they pleaſe; which hath many inconveniences: as firſt, cattle ſpoil as much with their heels as they eat, eſpecially if the ground be moiſt, or if the flies be very troubleſome, and they blow, and ſtench, and tumble much; and if the fly is buſy, they run up and down, and over-heat themſelves, and fat very little; ſo that oftentimes in *June* or *July* they fatten as little as at *Chriſtmas*, and moſt of their dung is loſt by this means, *&c.* But in *Holland* they do thus; they keep their cattle houſed winter and ſummer: for the winter-proviſion they lay in not only *Hay* but alſo grain, which they buy in ſummer and bury in the ground: and alſo *Rapeſeed*-cakes, and ſow *Turnips* not only for themſelves but their cows alſo. They ſlice the *Turnips* and their tops, and with *Rapeſeed*-cakes and grains, they make meſhes for their cows, and give it them warm, which the cows will ſlop up like hogs; and by this means they give much milk. In the ſummer time they mow the great *Clover*-graſs, and give it them in racks; ſo that their cattle are not troubled with pinching froſts nor rains, nor with the parching ſun in ſummer; neither with the fly, nor do they over-heat themſelves,

ſelves, or ſpoil half ſo much meat; and are always as fat as their maſters, or bacon-hogs. The dung and urine they carefully preſerve, and thereby keep their meadows and *Clover*-graſs (which are conſtantly mowed twice or thrice yearly) in good heart. And indeed cattle ought not to go among *Clover*-graſs, becauſe it uſually grows with long haum (as they call it) like *Peaſe*, which if it be broken will not thrive. In *Bermudas* they have a peculiar way of fattening their cattle, not uſed any where elſe that I know, which is with *Green-fennel*, that grows in that iſland plentifully.

There is a plant in *Eſſex*, call'd *Myrchis*, or *Cow-parſley*, which grows faſt and early in the ſpring, which they give their cattle at the beginning of the year, and they eat it well.

It is an ill cuſtom that is uſed almoſt every where, to let hogs lie in their dirt and dung when they are fattening; for all creatures generally do hate and abhor their own dung: and an hog is the cleanlieſt of all creatures, and will never dung nor ſtale in his ſtie, if he can get forth, which other creatures will: and tho' he tumble in the dirt in ſummer, yet that is partly to cool himſelf, and partly to kill his lice, for when the dirt is dry, he rubbeth it off and deſtroyeth the lice thereby.

Sir *Hugh Platts*, in his writings, ſets down divers ingenious ways of fattening poultry, *&c.* and more may be found out daily. The *Jews* have a peculiar way of fattening geeſe, with milk, figs, raiſins, and other ſweet things, by which they make the liver of an extraordinary bigneſs, and is a diſh much valued by them.

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In *Moorfields* there is one that keeps many hundred coneys with grains and bran: and ſome others who keep the great laying ducks, with theſe things and blood, to their great advantage. I have ſeen a book tranſlated out of *French*, which teaches how to gain divers hundred pounds *per ann.* by fifty pound ſtock in hens. I ſuppoſe about *London*, where eggs are ſo dear, great profit might be made by them. Turkeys may be kept with great profit where there are many meadows, as in *Suffolk*. In *Berkſhire* many keep tame pheaſants, and have gain'd well thereby.

Of Improvements in the Dairy.

III. We do not know how to improve the commodities proceeding from cattle to the beſt advantage: as for example, Our ordinary butter might be better ſcented and taſted: ſome ladies have fine ingenuities in this kind. We cannot make cheeſe comparable to the *Parmiſan*, nor ſo good as the *Angelots* of *France*. Our ordinary cheeſe is not comparable to the *Holland* cheeſe; wherealſo divers ſorts of cheeſes are made of divers colours: but I cannot much commend their green-cheeſes, which are made of that colour by ſheeps-dung, *&c.* But I hope in ſhort time our good houſewives will ſcorn that any ſhall excell them.

CHAP. XXI.

Concerning the want of divers things which are neceſſary for the accompliſhment of Agriculture.

1. THAT we have not a Syſtem or compleat book of all the parts of Agriculture. Till the latter end of Queen *Elizabeth*'s days I ſuppoſe that there was ſcarce a book wrote of this ſubject; I never ſaw or heard of any. About that time *Tuſſer* made his Verſes, *Scot* wrote about a *Hop*-garden, and *Gouge* tranſlated ſome things. Lately divers ſmall treatiſes have been made by Sir *Hugh Platts*, *Gabriel Platts*, *Markham*, *Blith*, and *Butler*; who do well in divers things; but their books cannot be call'd compleat books, as you may perceive by divers particular things not ſo much as mention'd by them. The *Country Farmer*, tranſlated out of *French*, is copious enough; but it's no ways fram'd or ſquar'd for us in *England*: and I fear the firſt authors went on probabilities, and hear-ſays, rather than experience. I hope ſome ingenious man will be encouraged to undertake a work ſo neceſſary and commendable.

2d Defect is, that Gentlemen try ſo few experiments to advance this honeſt and laborious calling, when many experiments might be made for a ſmall matter; for half a pole ſquare will give as certain a demonſtration as an acre, and a pottle as a hogſhead. I hope in time there will be erected a college of experiments, not only for this, but alſo all other mechanical Arts.

3d Defect is, that Gentlemen and Farmers do not meet and communicate ſecrets in this kind, but keep what they have experimented themſelves, or known from others, as *Sybils* leaves: I mean, as rare ſecrets not to be communicated. I hope that we ſhall ſee a more communicative ſpirit among us e'er long. And, Sir, I cannot but deſire you, if you have any thing more in your hands of *Gabriel Platts*'s, or any man's elſe, that you would with ſpeed publiſh them.

4th Defect is, we want a place to which men may reſort to find ſuch ingenious men, as may be ſerviceable for their ends and purpoſes; and alſo know where to find ſuch ſeeds and plants as they deſire, as the great *Clover*-graſs, *Saint Foin*, *La Lucern*, &c.

5th Defect is, that men uſually covet great quantities of land, yet can't manage a little well. There were among the ancient *Romans* ſome appointed to ſee that men till'd their lands as they ſhould do, and if they did not, to puniſh them as enemies to the publick: perhaps ſuch a law might not be amiſs with us; for without doubt the publick ſuffers much by private men's negligence. I therefore wiſh men to take *Columel*'s counſel; which is, *Laudato ingentia rura, exiguum colito.* For *melior eſt culta exiguitas*, &c. as another ſaith, or as we ſay in *Engliſh*, *A little Farm well till'd is to be preferr'd:* for then we ſhould not ſee ſo much waſte-land, but more induſtry, greater crops, and more people imploy'd than are at preſent, to the great profit of the common-wealth.

CHAP.

CHAP. XX.

The neceſſity of God's Bleſſing on the Huſband-Man's Labour.

THO' the Huſbandman has been laborious and diligent in his calling theſe laſt years, yet our crops have been thin, our cattle ſwept away, and ſcarcity and famine hath ſeized on all parts of this land; and if we had not been ſupply'd from abroad, we had quite devour'd all the creatures of this iſland for our ſuſtenance; and yet we could not be ſatisfied, but muſt have devour'd one another. And therefore to conclude, tho' I deſire the Huſbandman to be diligent and laborious in his calling, yet I counſel him to *break off his ſins by repentance*, to have his eyes towards him who is the *Giver of every good thing*, and to pray daily to him for his bleſſings, who *giveth freely to them that ask*. And tho' all callings ought to look up to him that is *on high*, yet the country-man eſpecially; for he hath a more immediate dependence on him than any other: for if the Lord with-hold his *fat dew from Heaven*, or the *former or later rain*, *it is in vain* that the Huſbandman *riſe up early and go to bed late*, *and eat the bread of careſulneſs*: for we know, that it is the Lord *that maketh barren places fruitful*, and he likewiſe *that turns fruitful lands into barreneſs*, (as the land of *Canaan*, which was very fruitful even in the time of the *Canaanites*, but now a barren deſert;) and therefore I again deſire the country-man to walk as it becomes a *Chriſtian*, *in all ſobriety*, *righteouſneſs*, *and godlineſs*: *not to truſt*

trust to his confidence in his own labours and good husbandry; *but on the Lord that hath made all things:* for tho' even St. *Paul himself doth plant, and Apollo doth water, yet it is only the Lord that giveth increase* and plenty, *which he will not deny to those that fear him; for they shall want nothing that is good.*

And thus, Sir, I have written to you very largely my thoughts concerning the Husbandry of this island, and partly what I have seen in my travels. Good Sir, be not offended at my long and impertinent stories, my rude language, and unmethodical discourse. It was, if not to satisfy, yet somewhat to gratify the universal goodness of your spirit, and care of the publick, which God has enrich'd you withall. And these are only my first thoughts, which in haste I have huddled together. I hope (if the Lord send life and health) my second thoughts shall be better: but whatsoever I have done, pray look on it as coming from one who is desirous to serve you, and to advance the publick good, according to the talent the Lord hath given him. Thus I commit you to the protection of the Almighty: and rest,

SIR,

Your humble Servant,

Anno 1651.

R. WESTON.

FINIS.